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Summary of Proceedings of the Watershed Analysis Conference:

FY94 Federal Experience

November 8-10, 1994
Eugene, Oregon

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The FY 1994 Federal Watershed Analysis Experience

Eugene Hilton -- November 8-10, 1994

The following report provides a summary of the *Federal Watershed Analysis: The FY '94 Experience* workshop, which was held in Eugene, Oregon, from November 8 through 10, 1994. The workshop was part of the ongoing interagency Pilot Watershed Analysis Program to develop a comprehensive analysis process and an updated analysis guide. The workshop provided opportunities to review and discuss completed and ongoing watershed analysis efforts, evaluate field application of the *Federal Agency Guide to Pilot Watershed Analysis* (including analysis process, analysis content, and interagency/intergovernmental coordination), and evaluate integration of watershed analysis into agency programs of work. Each day of the workshop was focused around a specific theme, with watershed analysis team presentations and afternoon workgroup sessions structured to address the day's theme. The daily themes were: Day 1 - What have we learned about how to accomplish Watershed Analysis?, Day 2 - How is Watershed Analysis being integrated into the planning process to accomplish projects and produce products?, and Day 3 - Agency Visions for the Future: How do we integrate Watershed Analysis into our day-to-day program of work?

The overall workshop was attended by over 380 people. U.S. Forest Service and Bureau of Land Management employees made up the bulk of the workshop registrants, followed by the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, Indian Tribes, representatives from State government, the Soil Conservation Service, and individuals and interest groups. Those in attendance represented a variety of job functions and professions, including line managers and USFS Regional/BLM State Office employees, with the majority primarily consisting of people directly involved in watershed analysis. Foresters and wildlife biologists made up the majority of attendees, followed by fisheries biologists, soil scientists, botanists, ecologists and others.

This report summarizes the workshop in two sections, with the first section providing a synopsis of the "large group" portions of the workshop (i.e., introductory talks, watershed analysis team presentations, panel presentations, and closing remarks) and the second section providing workgroup reports, consolidated by topic, from the "small group" work sessions.

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Workshop Report - Part I: Synopsis of "Large Group" Sessions

Watershed Analysis Workshop
Day 1 - Opening
November 8, 1994

Introduction/Welcome - Deigh Bates (Moderator) - Hydrologist - Willamette National Forest

Day 1 Theme: What have we learned about how to accomplish Watershed Analysis?

Deigh discussed the importance of sharing what work has been done and what has been learned in watershed analysis, and he identified this as the goal for the meeting.

Don Knowles - Director of the Regional Ecosystem Office - Portland, Oregon

- Need to recognize the accomplishments that have been made. Watershed Analysis is the fuel that drives the ecosystem management process.

- Watershed Analysis builds credibility and trust with the public. Watershed Analysis allows us to gain logistical information and develop targets and goals to work toward.

- We need to tell the watershed analysis story better. We have done 40 WAs in the last 6 months - it has been a new and creative process - and policy makers do not know or recognize this yet. It is a new and unique process that people should be proud of. Watershed Analysis embodies many of the diverse promises made in the President's Forest Plan.

- Now we need to determine how to incorporate what we have learned into the planning process. How do we integrate WA into our everyday work? We need to make sure that WA is kept in context - remember the big picture - understand how to use information and not be simply caught up in the accumulation of information.

Darrel Kenops - Forest Supervisor - Willamette National Forest

Welcome to Eugene, Oregon, and to one of the most important conferences in the Pacific Northwest! The next three days will be a tremendous learning opportunity and an opportunity to practice adaptive management.

Our first year of experience in implementing the President's Forest Plan has seen many successes and some frustrations. It has been like two or three years rolled into one.

I think it is important to remind ourselves that the main elements contained in the President's Forest Plan are to use the best science in designing forest management projects while also helping people, families, businesses, Indian Tribes and communities in transition.

In this first year of implementing the plan, the Forest and the Willamette Province used three levels of watershed analysis to accomplish the important objectives of the plan. The three levels include: preliminary assessments for watershed restoration/Jobs-in-the-Woods; intermediate analyses for designing and implementing other projects; and comprehensive analyses known as pilot watershed team efforts.

Each level was successful in its own right, and each taught us what it means to work across administrative, geographic, discipline/professional and philosophical boundaries. You will hear more about these lessons from our South Fork McKenzie Watershed Analysis Pilot team effort, so I will not share them now.

Informally, you will share your experiences, insights and nuggets of wisdom. This exercise will be useful in checking our current course, determining what changes should be made to our *Federal Agency Guide for Watershed Analysis*, and providing suggestions for how we should be doing our work across all programs.

There are three questions that encompass the agenda that I'd like to discuss with you. This conference will focus our collective experience and provide the next round of answers, questions and work planning approaches.

1) What did we learn, how did we do, what constraints did we encounter, and what timelines are appropriate?

I'd be remiss if I did not start out by sharing with you that our two-week interagency watershed restoration/Jobs-in-the-Woods approach was seen, by many who participated, as a success in targeting projects and helping meet worker and community assistance objectives. These projects will be evaluated by the Pacific Rivers Council in all three states (Oregon, Washington and California).

For intermediate and comprehensive watershed analyses we were pressed to meet timeframes. This was complicated by a severe fire season and organizational downsizing.

This conference needs to identify the constraints and barriers in WA and suggest solutions or promising approaches to address them. Timelines are a critical element and will vary based on the skills available, the

complexity of your situation and the availability of budget resources. The central question is: Is it possible to move at a greater speed while ensuring quality? If so, how? A listing of timeline factors and a sequencing of activities would also be helpful.

2) How did we do from an interagency viewpoint, and what are the challenges for future interagency involvement?

I feel good about the FY94 interagency involvement as a Forest Supervisor and Willamette Province Team member. Again, each of you have your experiences that need to be shared and captured. In our case, people like Russ Peterson, U.S. Fish & Wildlife Service, Ron Lee, Environmental Protection Agency, Wade Stampe, Army Corp of Engineers, Judy Nelson and Mark Lawrence, Bureau of Land Management, and National Marine Fisheries Service and Soil Conservation Service colleagues were helpful, involved, and positive contributors to forward progress.

The future challenge will be merging Federal agency watershed priorities with non-Federal agency/organization priorities, especially in Fiscal Year 1996 and beyond.

In the Willamette Province, we have over one hundred 5th field watershed priorities, and that is only phase one of what I see as a four-phase process in gaining alignment across all interests.

In FY95, the Willamette Province Interagency Executive Team has three deliverable product challenges: 1) a base map to illustrate Watershed Analysis projects completed and remaining priorities across all interests; 2) recommendations on river basin planning; and 3) input into non-Federal discussions about watershed restoration priorities.

3) What does the future hold in terms of policy, program budgets and organizational structure for watershed analysis?

People are discovering that watershed analysis is truly the foundation for most of our activities. This means that many discussions around this question are occurring now because of program budget and organizational structure impacts.

Our Fiscal Year 1994 experiences will shape and be included in policy, program budget and organizational discussions in the following manner:

a) The Fiscal Year 1996 Congressional Program Budget Hearings in the Spring of 1995 will be one place where the products of this conference are likely to be shared.

b) We will see greater movement toward combined field operations and arrangements that extend beyond watershed boundaries. This will include larger landscape planning through such things as Conservation Planning and Section 7 Consultations under the Endangered Species Act.

At a recent Regional Forester and Bureau of Land Management State Director meeting, both leaders encouraged us to move quickly to integrate operations to gain efficiency and effectiveness. Watershed analysis is one of those areas where this integration is essential.

In the Willamette Province Interagency Executive Committee, we have begun discussions about further integration of efforts with the U.S. Fish and Wildlife Service and Environmental Protection Agency colleagues.

c) Use of proponent financing and consultants will increase as we realize the broad scope of watershed analysis. We currently do not now have all the skills necessary to complete the first round of Watershed Analysis in 3-to-5 years.

d) Program budgets and timeliness will continue to be a challenge for watershed analysis. We need to be effective and efficient in our approach. We need to deliver a quality product in a timely way to project teams who can then design and/or work with proponents to implement projects.

In closing, I feel this conference will go into the history books. This conference will help us move toward the 21st Century in our practice of ecosystem management. I look forward to reading the summaries of the working groups. This will help us all check our policy and practice in applying watershed analysis and make improvements. Best wishes for a successful conference.

Watershed Analysis Team Presentations

Pilot Creek Watershed Analysis Six Rivers National Forest

To show all of the different levels of learning that occurred during their WA experience, the Six Rivers team put on a skit and requested audience participation. They identified several key points in the WA process and asked the audience to agree or disagree with their interpretation of the process. The skit not only showed how their team dealt with the many different WA issues, the audience

participation highlighted where there are differences and similarities in the interpretation of the WA process.

Key Points/Interpretations

1. Line officers and managers have the ability to commission and guide WA. (90% of the audience agreed)

2. There are three distinct groups that we are serving/addressing: the scientific community, the general public, and managers. (80% of the audience agreed)

3. The Federal Guide is only a guide and not a strict rule. (99% of the audience agreed)

4. Interagency collaboration is worthwhile and we need to keep trying to make it work. (99% of the audience agreed)

5. What is WA? How do you proceed? We only need to pose key questions in a way that can be answered in the first step in WA. (30% of the audience agreed, 30% disagreed and the rest were undecided)

6. We do not need to set desired future conditions unless they are clear and we know what we mean by them. (33% of the audience agreed, 33% disagreed and 33% were undecided)

7. We should not regard inventories as necessary in the first round of WA. (92% of the audience was in agreement)

8. How long should a WA take? Less than a month. (No one in the audience agreed.) Two to four months. (No one in the audience agreed.) It depends, some will be quick, some will take a long time. (99% of the audience agreed.) It is never done. (99% of the audience agreed.)

9. Finding the links between disciplines is critical to the success of WA. (80% of the audience agreed)

<u>Questions from the Audience</u>

1. **Q:** Was the staff dedicated only to WA or did they have other responsibilities? **A:** The team had other responsibilities. This was their major barrier.

2. **Q:** How long did it take to do your second WA after your first WA was completed? **A:** Two months.

3. **Q:** Is there some concern about finding all the answers to the different questions raised? **A:** Collectively, they are so much further along than they were one year or six months ago. There are other watershed restorations going on, so the workload is tough. There needs to be more comfort in not having all the information and being able to make assumptions and proceed without fear. The social scientists brought this perspective to the team.

4. **Q:** What is the most important thing that managers should know relating to what your team found? **A:** The role of fire and the implications that have resulted from our fire suppression policies. They needed to go to a larger scale to gain the appropriate information about vegetation. The public had a great deal of information and knowledge (sometimes more than the specialists).

5. **Q:** How did they get the information from the public? **A:** They did research and contacted individuals who had lived in the area a long time. They tried to get both historical and resource information and integrate them. They also had a good interviewer. They made the public feel that their input was needed and would be used. They interviewed a broad range of people [not just people at the watershed], and also accommodated their schedules. Through this public outreach, they found out that there had been no salmon in the area since the 1980s, and this information prevented them from going down the wrong path.

6. **Q:** Will this cadre continue to do WA, or if not, how will you bring new people in and train them? **A:** Team participation is the most important aspect. Foster teams that are working well and find ways to fix those that are not working well. They will continue to function, but they are still bringing in folks who can work on WA on an adjunct basis.

7. **Q:** What parts of the Federal Guide did you use and find most helpful? **A:** The guide was general enough to help but they avoided some aspects. The vision of WA, and not the details, needs to be articulated better. The modules seemed to be misleading but helpful in general. There may be an over-emphasis on desired conditions, questions and key issues.

8. **Q:** Did you overlay the area with the Forest Plan designations? **A:** Yes.

9. **Q:** There needs to be a willingness of the land management agencies to incorporate the regulatory agencies and a reasonable amount of time and forewarning must be given to those agencies. How did you address this? **A:** They set up a WA shop at an agreed-upon location so that they could pool their efforts and share space and scarce resources. It is beneficial to identify specific points in the process that these agencies should be involved in so that their time can be used most effectively.

10. **Q:** Have you made up a list of projects or things to do once WA is done? **A:** They just did the analysis. It is important to tie into the broader, larger scale. This should be the next phase of the process.

Little Naches Watershed Analysis
Wenatchee National Forest

Little Naches is adjacent to Mt. Rainier and has both east and westside characteristics. They have several owl sites. The area has been "heavily managed." Little Naches is a very diverse area.

They call themselves the Ecosystems Assessment and Restoration Team. The team members dedicated 70% of their time to WA.

They put a GIS specialist on the core team as soon as they found out how important GIS was to the process.

Slide Presentation

1. Regional Watershed Goals and Evaluation Criteria. Define the condition of the watershed: They had 11 evaluation criteria from a Region 6 guidance document.

2. Eight-Step Process and GIS: There was no framework on how to complete the task. They felt the steps overlapped in the 8-step process.

Step 1 - Issues and Key Questions

Step 2 - Key Processes and Functions: Identified how the issues related to goals and refined issues.

Steps 3 & 4 - Stratify and Assemble Analytic Steps: It was hard to decide how to stratify. They developed several types of stratifications - vegetation and landforms seemed to be the best layers. They then went to gather information. The role of GIS was critical to this step. They provided maps to help the team and then produced maps for the final document. They had 143 requests, 29 layers, 3,182 hours worked, 18 screen prints, 184 maps, 94 reports, and 226 computer processing hours.

They integrated information from existing databases. They used a Paradox - MOSS link. They used a vegetation poly link/current successional stage/historic stage to generate maps. They broke it down into human/nonhuman influences.

Steps 5 & 6 - Describe Past and Current Conditions/Trends and Management Effects: They wrote Chapter 5. The desired future conditions were done in general terms and they wanted to present this information in a user-friendly manner. They decided to use a chart.

Step 7 - They felt this should have been Steps 1, 2 and 3 and done throughout the process. They wanted to produce a usable product for the Forest to embark on ecosystem management. They developed a resource sensitivity chart that compared fish production units with specific resource factors (e.g., sediment, fire occurrence). Then they presented this visually. This process allowed them to identify areas of sensitivity.

Chapter 5 included monitoring. The chart they developed identified causal mechanisms. They tied desired future conditions back to their issues to keep their process focused. They identified priority areas and resource opportunity areas and developed management recommendations. This chart can be useful in an EIS process. Identifying priority areas and desired future conditions can really speed up and help the NEPA process.

They identified areas where catastrophic fires and harvesting had occurred, and noted different stand characteristics and past practices on fire/fuel loading. This information was then used to display areas of low and high risk. They then identified priority areas and provided management recommendations - resource opportunity areas - and identified what specialists needed to be involved (vegetation management, recreation, fire fuels planning). This provides managers with a quick and easy way to identify what decisions need to be made (e.g., watershed restoration needs, road management, etc.).

How do you update the WA report? This should be a dynamic process with yearly updates and necessary revisions.

In evaluating their process they identified the following *weaknesses*:

1. Interagency participation (Solution - increase scoping)

2. Incorporation of public/social values (Solution - recruit someone with social expertise and increase training on the Forest)

3. Felt limited by the existing hardware/software at the district

4. Recognized the need to work with more outside groups

They identified the following *strengths* in their process: Watershed analysis provides management guidelines, builds on available information, addresses restoration needs, and identifies low-risk and high-need areas.

Questions from the Audience

1. Q: Were there significant uncertainties in your modules/technical analysis that you had trouble with? How did you budget your time? A: This is the pre-work to NEPA. Each management recommendation will not address each issue raised in the NEPA process. This is the first shot. They identified where there were gaps and addressed only those issues they felt confident about.

2. Q: Did you have conflicts between existing plans and WA? A: They identified what amendments would have to be made to the Forest Plan. There were not many blatant inconsistencies.

3. Q: Did you identify differences between your desired future conditions and the actions of other federal/private lands? A: They have enough information on private lands that it will influence their management in certain ways.

4. Q: How do you anticipate synthesizing your process with the Department of Natural Resources (DNR) process? A: The DNR is more site-specific, but now that we have our information, our processes should mesh well and complement each other. The State develops prescriptions and we are not trying to take our process that far.

5. Q: Did you establish riparian reserves or did you default to the buffer recommendations of the Scientific Assessment Team (SAT)? A: They left them as they are identified in the ROD. They identified specific areas that might need more attention.

6. Q: Did you get information from other sub-basin assessments and were they useful to you? A: Habitat information was very helpful as was the Eastside Ecosystem Management Process.

7. Q: Do you see synthesis between the State DNR and FS/BLM assessment process so that we don't duplicate each others' efforts? A: The process is iterative. The State process focused on landforms; not biological processes. They have developed relationships with DNR. In the future, the State can use information from the start. They had open working meetings twice a month. DNR used base information and then went out and honed their study.

8. Q: What emphasis was wildlife given? Was there a wildlife module? A: It was incorporated into landscape function.

9. Q: How did you get your historic vegetation layer? A: They worked back off their stand exams and several vegetation inventory sources (e.g., ecoplot, PETS, plant recons, etc.). They also had a fire 100 years ago that made it easy to determine dates.

10. Q: Why did you pick fish rearing as your basis rather than something like fire or vegetation? A: For management purposes, they used fish productions units as delineations of sub-watersheds because they make good natural breaks.

11. Q: How much time did your team actually spend in the field? A: They spent a minimal amount. All of the team members had been on the district for at least 3 years and had all worked together on a variety of projects. The area is heavily managed, so a lot of the stream surveys had already been done. They didn't go out as much as they would have liked. They spent a lot of time looking at the maps, and that reduced the need to go out.

12. Q: How did you decide to take the management focus that you did? A: They wanted the district to buy into WA and support it.

Wrap Up

The team felt that their WA was somewhere in the middle between the bare minimum and FEMAT. They feel that their WA is a good place to start, but it's a continuing process. Assessing where your team ended up, and if it is where your district thought you would be, is extremely important. The district fully supports what the team did in this first effort, and they plan to continue doing WA at least at that level of detail.

Nestucca Watershed Analysis
Salem District - BLM
Siuslaw National Forest

The Nestucca Watershed is a 163,000 acre basin with 65% federal ownership. The watershed drains into the Pacific Ocean, and it is entirely within an Adaptive Management Area (AMA) and primarily within a Late Successional Reserve (LSR).

The team is interagency - BLM, FS & FWS. Initially it was hard to communicate with each other (different acronyms, etc.).

The team divided the watershed up into 39 sub-watersheds. The terrestrial side was driven by vegetation. They only have about 200 acres with trees older than 200 years. This allows them to focus on what they are working toward (LSR). They then subdivided the area by habitat zones. The major impact was catastrophic fire. They compared historic and current conditions.

They mapped the different ROD classifications in the area and developed management opportunities.

Aquatic - Fisheries - Water Quality

Water temperature was an issue that surprised them. Sedimentation was also an issue. There was no information, however, on what levels of sedimentation have occurred in the past. They identified natural landslide areas. They looked at the impacts from timber harvesting and road building and analyzed them using aerial photography. They found a large variety of anadromous fish species using a select number of streams. This allowed them to focus on priority streams. They were data rich, but it took a great deal of time to get the information in a usable format.

The sedimentation from the fires had affected the fisheries. Floods, heavy timber harvesting, a dam break, and stream "cleaning" in the 60's had also greatly impacted the fisheries. The team identified productive flats with the highest potential for fisheries habitat. Pool habitat in the watershed is lacking.

Stream restoration is a temporary fix. There is a need for conifer regeneration to provide down/woody debris.

They developed a charter and a plan. They used the pilot guide, but realized that there were things that they wanted to change. They put a lot of time into questions and issues and they were very focussed. However, as they got further into the process, it became less focussed. The desired future condition worked for this group. They thought the modules were very good starting points. Some, however, did not apply to the Nestucca watershed, or if they did, information was often lacking to complete the module. This was troublesome, since they thought the public would hold them to the letter of the Federal Guide. They did not have the time to get to specific sections of the stream to do their analysis. Their map packets were extremely expensive.

They want to de-emphasize the process. When part of the Federal Guide does not apply to them, they will now more quickly skip over it. They also would have spent considerably less time working on the issues and key questions.

Data

Standardization is extremely important. Much of the data used to develop any given data layer came from two-to-five different sources. Even Federal agencies use different databases (e.g., BLM's data was in MOSS, FS's in Arc/Info, and SCS's in GRASS). This was very time consuming. Furthermore, the differences in data standards and collection methods resulted in much of the data being incompatible. In some cases, they were able to develop a way to compare these different numbers.

WA has prompted them to use GIS for complicated analysis; not just information storage. However, GIS does add time to the process.

What WA Should Look Like

WA will identify management opportunities that could be applied consistently with the Standards and Guidelines to achieve the desired future conditions. Management opportunities could involve cooperative efforts between federal agencies and state, county and private landowners. They now have theories on trends that are based on historical information and current conditions. They also have a desired future condition.

Public Involvement

Fieldtrips were very successful. The public responded to requests to go out in the field and it was a learning opportunity for both the agency and the public. Working interest groups, focussed on wildlife, soils/hydrology, and fisheries, also worked well. They allowed the public to focus on those issues that most interested them. The working groups served to provide updates to people on where the team was in the WA process.

The team took advantage of the different strengths of the involved agencies. Some sharing between agencies had occurred in the past, but this process allowed them to learn more.

Questions from the Audience

1. **Q:** How did you get the private land data? **A:** Private industry was not interested in cooperating with them. They got some information from the county and consultants. After trust is built up, this could improve.

2. **Q:** What did you do with Riparian Reserve widths? **A:** Nothing. They looked at the ROD S&Gs that dictate the widths and they didn't touch them. What they did say was that the ROD S&Gs did not limit them from doing most of the things that this AMA was designed for within the reserves.

They did not have a great deal of information on the vegetation in the streamside riparian zones. We need to be up front about the assumptions that are made when there are gaps in the data.

Watershed Analysis Workshop
Day 2
November 9, 1994

Moderator - Polly Hays - U.S. Forest Service Regional Office - Region 5

Day 2 Theme: How is Watershed Analysis being integrated into the planning process to accomplish projects and produce products?

Watershed Analysis Team Presentations

South Fork McKenzie Watershed Analysis
Willamette National Forest

Most of the talk will deal with Riparian Reserves.

About 68% of the land is in federal ownership, 61% FS and 5% BLM. They were able to analyze a typical watershed in their area. The area has old-growth, Bull Trout, Spring Chinook, Northern Spotted Owls and dams. There is an AMA in the northern portion of the watershed, a Late Successional Reserve, and the Three Sisters Wilderness. Geology is a major factor in their area. Cougar Reservoir has significantly affected the area.

The Ranger Districts and the Supervisor's Office all contributed people to the WA effort in order to give a variety of people experience in WA and also to avoid unduly impacting one unit. Many of the team members were detailed to WA full time. This commitment was extremely important to the WA process.

Key Issues:

- Tier 1 key watersheds
- past management effects
- cougar dam - has had the greatest effect
- recreational use
- human demands

Key Questions: Developed 50

Federal Agency Guide: They used the guide and thought it was good. It was helpful in the start-up phase. The desired condition section was not used. Modules should be followed only where consistency at higher scales is important.

Information Manager: They had an information manager. This position was critical to their success. She would sort out information requests, decide who should handle them, and ensure consistency between data requests. She also facilitated an Information Needs Assessment (INA).

INA Process: Identify existing data and identify the data you need. Define collection methods, identify integration needs, and develop a data acquisition plan and a data integration plan.

This process was very helpful because it got them thinking about what information they needed in order to answer their questions and also helped define the scope of their analysis. They reviewed this process in an interdisciplinary fashion. This took longer - but it required the specialist to do their homework before they met.

Start-up Phase - prepare basic layers e.g., vegetation, streams, soils. This can be done before the team is formed.

Without the data manager, GIS and a GIS technician this process would not have been possible.

Riparian Reserves: One of their key questions was how to determine riparian reserve widths. When the team asked the audience how many other WA teams recommended expanding riparian widths, 6 people raised their hands. Four people raised their hands when asked if they had made attempts to determine where riparian reserves could be reduced. This team felt that this was a key question that should be dealt with by the WA team.

They first outlined the ROD objectives for Riparian Reserves.

1. Aquatic Functions -- Maintain and restore riparian structures and functions.

The team developed rigorous screens to protect and ensure slope stability, identify large woody debris sources and valley segment types (e.g., U-shaped glacial troughs) because not all streams are created equal.

2. Other Riparian Species -- Confer benefits to riparian-dependent and associated species.

3. Transitional Species -- Enhance habitat conservation for terrestrial organisms that are dependent on the transition zone between upslope and riparian zones.

This is difficult since different species have different transition zones. You have to go beyond the riparian vegetation to do this - and you need to incorporate this into your design.

4. Travel/Dispersal Corridors -- Improve travel and dispersal corridors. Riparian zones do not provide the appropriate travel corridors for all species. You need to look at this when deciding how to go forward. This often required making trade-offs. The edge effect in riparian reserves can be high. You need to recognize the risk this causes to non-riparian species.

5. Connectivity -- Provide for greater connectivity and serve as connectivity corridors among the late successional reserves.

Design 1 - Expanded Riparian Reserve Widths - "Bulging Spaghetti": Expand riparian reserve widths where screens show that you have risk.

Design 2 - Riparian Reserves with Supplemental Blocks - "Spaghetti and Meatballs": These blocks meet a variety of objectives. They provide connectivity with old-growth and enhance connectivity in LSRs. This design is not perfect, you still have an edge effect.

Design 3 - Historic Fire Regimes - "Garlic Bread": Recognizes the necessity for all seral stages.

Going through the objective-driven riparian reserve process you can determine what you can do to ensure that different parts of the riparian reserve can provide for these objectives.

They think that Design 2 would provide protection for a variety of different species. Design 3 would probably be the best, but more difficult to achieve. In the meantime, bulging spaghetti will work.

Questions from the Audience

1. **Q:** How do you address social processes and functions in riparian reserves? **A:** They had quite a bit of involvement. They did research on the history of the area. They didn't have the ownership patterns that really allowed for the same type of involvement that other WAs experienced.

2. **Q:** Why don't you consider changes in the riparian reserve to be a decision requiring NEPA documentation? **A:** This has not been fully worked out.

3. **Q:** How did you do your stream mapping? **A:** They produced 4-inch-to-the-mile topographic maps. It needs to be field verified on a site-by-site basis and they will probably find more streams when they go out in the field.

5. **Q:** If you apply Design 3, should you expand it beyond the watershed? **A:** It would necessitate going outside, but you don't have to change the world all at once. Even if you simply did it in the watershed, it would still be an improvement.

6. **Q:** Which of your designs best accommodates survey and manage species? **A:** Design 3 would be the best, then Design 2 and finally Design 1. Design 3 allows managers flexibility based on what is found in the field.

7. **Q:** How much time would you have saved if you had your vegetation, streams, and soils ready before you started? **A:** Hard to say, since so much work had to be done with soils. They spent more time deciding how to map streams than it took to map them. It could save 2 weeks to 5 months depending on your particular situation.

8. **Q:** What activities can occur in the riparian reserves? **A:** They looked at all the different activities in the area and then looked at their five objectives. For example, you can do thinnings in all of the areas, but they have to be done to reach the objectives of the riparian reserve - not for volume. This applies to salvage and firewood. The focus will be on objectives. Management needs to trust the interdisciplinary team.

9. **Q:** Did you find that your WA helped you determine how much down, woody debris you needed? **A:** Yes, they did. They looked at fire history to determine what the natural down and woody debris would be and then at their objectives relating wildlife and riparian reserves. They determined that their level was good enough.

10. **Q:** Was garlic bread driven by terrestrial, while the first two were driven by riparian considerations? **A:** The first two definitely emphasized riparian, but they did not ignore terrestrial. The third looked more at terrestrial. However, it would not be a good idea to try to merge the designs, due to the lack of flexibility related to matrix lands.

11. **Q:** Do you have slope stability concerns? **A:** Slope stability did play a major role. At-risk areas were delineated to meet the objectives (Class 4 areas) of the ROD. They went out and looked for them, mapped them and then took them out of the base.

12. **Q:** What was the experience like from the perspective of the U.S. Fish and Wildlife representative on the team (Ray Baush)? **A:** He would like to get involved earlier. He will get involved in as many as he can as early as he can. He learned a tremendous amount about the Willamette National Forest and their decision making process. This interaction gives the regulatory agencies a better understanding of how land management agencies work. The team felt he provided them with a great deal of insight

and help. About 20% of his time was dedicated to the WA. This next year he may be involved in about 12 - so 20% each would not be possible, but he hopes to use his time more effectively. It will be impossible to be involved in the daily decision-making process. His number 1 goal is to bring the FWS perspective to watershed analysis teams so that they can understand what FWS will be looking at during consultation. Ideally, it would work best if FWS had initial input and then some pulse checks as the process continues.

13. **Q:** Did this process provide enough information to go to consultation? **A:** They did look broader, since you cannot manage for a species by only looking at one watershed. They have definitely gotten a start on the information needed for consultation. FWS does encourage that a broad perspective be brought to the WA process.

14. **Q:** How are you handling this process - how are you storing your information - how are you filling any data gaps you found - are you changing hiring priorities as a result? **A:** It is a little unclear as to how WA will be formally incorporated, but there is a commitment to have the information used. This underscores the need to have the managers on board. The information is archived, but the process of integrating the information back into the district processes will happen in the winter.

Odell Watershed Analysis
Deschutes National Forest

They have a soils scientist, writer-editor, plant pathologist, landscape architect, silviculturist, wildlife biologist, fisheries biologist, fire management specialist, forest planner and GIS coordinator on their core team. Having a GIS coordinator on the core team was very important.

This was a Forest effort. They had co-team leads - one from the Supervisor's Office and one from the Ranger District. The co-lead served as a tag team approach and allowed for continuity and consistency when energy levels were down or when people were on vacation.

Watershed Ecosystem Analysis

They thought the guide provided good information, but they wanted to look at the process more holistically.

Their process was called a Watershed Evaluation & Analysis for Viable Ecosystems (WEAVE), and they broke it down into five phases:

A. Orientation/Context
B. Data Analysis
C. Team Teaching
D. Synthesis/Integration
E. Landscape Goals

- Put the watershed in its context - where does it fit in the world? Unique critical areas, key questions.

- Gathering of information - scientific data analysis.

- Information Sharing - this is probably the most important aspect, because it allows for an understanding of the entire function of the watershed.

- Synthesis and integration of information, key trends, landscape areas.

- Identify goals and opportunities, restoration of landscape areas.

They did their watershed rehabilitation assessment in conjunction with their WA. They kept things spatially oriented by using maps and tying issues to actual places.

They subdivided the ecosystem into biological, physical and social domains in order to study it. They thought the modules were too specific to start with. Using these three groups they developed models - showing linkages within them and then determined what modules to use - they used the guide to help them develop their modules.

"Team teaching" (having each member of the interdisciplinary team explain to the others what is important about the watershed from their disciplinary perspective) was essential and allowed for critical review. This gave them the ability to go to public meetings and discuss other people's specialties if they were not there. Team teaching forms the foundation of interdisciplinary understanding. This foundation of knowledge is critical for synthesis and integration of ecological functions and processes. They tried to have specialists write other specialists' sections in order to keep the process integrated.

They recognized that the watershed has the potential to work perfectly if left to its own devices, and they asked themselves how to best facilitate this process in light of human impacts.

Recognizing that form follows function - the team wanted to determine what was going on within the watershed. They stratified the area into different functions and identified trends. They coalesced 11 different trends during the integration phase of the process, starting with 200 social and wildlife trends, then defining "trend" and narrowing it down to 39 and then to 11 trends.

They took each trend back to its root cause to determine if it was a trend. They then tried to prioritize the trends. Red signified a high priority trend, yellow signified a trend at risk of being red, and green signified a trend that was working. They used the following formula to evaluate trend: **sensitivity x risk = trend rating.**

The team then delineated the trends on a map of the area and showed the relationships of all of these different trends. This was done to try to show people how these trends were actually playing out on the ground. Then they developed goals for the areas and set objectives. All of the objectives had to be related to key trends. Any opportunities or restoration activities subsequently identified had to be related to these objectives. If an objective was related to a Standard/Guideline in the President's Forest Plan, this was also noted in the document.

The Deschutes NF has already started to utilize the team's goals and objectives. Their data integration person worked with the Forest to determine restoration needs and opportunities for the Forest - it was then linked back into Forest priorities.

The most important thing the Forest has to look at is how to survey and collect data. They only had information on 1/3 of their watershed, the areas that had extensive timber harvest. They need to get different data in order to successfully do ecosystem management.

Questions from the Audience

1. **Q:** Have you discovered opportunities after the six months that you didn't find in the two week study? **A:** The six month process brought about more integrated conclusions and information. They were able to prioritize things and be scientifically credible.

2. **Q:** How did you decide how big of a watershed to look at and how did you decide what things were too big and what things were too small? **A:** They had some geographic factors that limited their scope. Data and GIS time factors also limited their scope. They looked outside their watershed to evaluate recreation and wildlife trends.

3. **Q:** How did you incorporate forest health? **A:** They looked at forest ecosystem function. They looked at things that threatened forest function like insects and disease.

4. **Q:** How did you do public involvement and integrate the social aspects? **A:** They met with a variety of individuals and found that there was a lot of dispersed and displaced recreation and that new people are coming to the area and bringing new ideas and philosophies. They found that as they integrated the social trends with the physical and biological trends, they were significantly interrelated.

5. **Q:** Would it be good for the guide to outline specific data that each watershed analysis should have? **A:** It would be helpful if the guide outlined a list of potential recommendations and ideas. This list should not be dictated, since there is so much variability among watersheds. It would also be useful to have a list of available information and ways to attain it (a clearinghouse type of function). The guide should provide suggestions for formatting the data.

6. **Q:** Did you do any investigation into historic, Native American use of the area? **A:** They have a liaison from Warm Springs and they identified traditional uses and water areas that were used for trading. These areas are now identified as having archaeologically sensitive values.

7. **Q:** What landscape characteristics did you use to determine landscape sensitivity and variability? **A:** They defined sensitivity as susceptibility to disease and catastrophic fire. Sensitivity was also evaluated in terms of the resiliency of the area to recover from disease and catastrophic fire. Areas were then defined as high, medium or low areas of sensitivity. These designations are subjective and applicable to this watershed and not necessarily other areas. The Pacific Northwest Research Station is a great source of information on identifying risk.

8. **Q:** When you overlaid the President's Forest Plan and found conflict, what did you do? **A:** They reviewed the Plan closely to determine if their objectives and opportunities were in compliance, and most of them were. Some discrepancies were identified, and they will be analyzed to determine if changes in allocations should be pursued.

9. **Q:** Was range management studied, and did you classify it as social or biological? **A:** There was no grazing in the area, as it conflicts with recreation and the geography of the area. They did look at noxious weeds.

10. **Q:** What are you doing to ensure that data gaps are filled? **A:** There will be a concerted effort to do the data gathering. Gaps should be clearly stated in the document, as well as research needs.

11. **Q:** You identify needs at the watershed scale and they go into your program of work, but there is a whole host of other watersheds. Are you spreading this need across areas - are you broadening the scale of this WA? **A:** This is a difficult issue and the transition is hard. Interagency, province level teams need to address this issue. A Forest Committee reviews results from various watershed

analyses and combines them with other issues to develop Forest Goals, Objectives and Priorities. Province teams need to do the same.

Watershed Analysis Workshop
Day 3 -- Closing
November 10, 1994

Moderator - Jerry Magee - Bureau of Land Management - Oregon State Office - Portland

Day 3 Theme - Agency Visions for the Future: How do we integrate Watershed Analysis into our day-to-day program of work?

Non-Pilot Watershed Analysis Presentation
Glendale Resource Area, Medford District, BLM

They have seven watersheds, no AMAs, and when they started the process, they had no modules and no REO guidance. How did they integrate WA? Their manager told them that they all were going to be involved in the WA process.

They had been calling this process landscape analysis. They identified their watersheds and assigned 3 - 5 different specialists to each watershed to serve as a core team. These individuals initially spent approximately one day a week on WA, which increased to 3-5 days/week in later phases of the process.

They used the final SEIS as a guideline to measure what they had already done, and they felt a lot of their analysis was already coming together. They felt the landscape analysis documents they had been preparing held up in many respects to the FSEIS.

They identified issues, concerns and watershed objectives and have used WA for budgeting and subsequent project implementation. They were comfortable with implementation because they felt it was a logical next step.

The team leader is responsible for taking the proposed action through the NEPA process. This person coordinates with the WAU (watershed analysis unit) teams, and organizes the interdisciplinary (ID) teams.

How They Propose Projects

1. A proposal goes to the WAU team and is compared with goals/objectives of the watershed based on goals/objectives of the ROD and knowledge of the watershed gained through the analysis.

Example: Goals: Maintain/improve Tier 1 watershed and maintain sustainable wildlife and plant populations.

Objective: Reduce road mileage to meet Tier 1 goals.

2. They identify people who should be involved in reviewing the proposal and choose an interdisciplinary core team to design the project. They then ensure that contacts are made with other agencies and private landowners.

3. They have a second core team meeting and firm up the proposed action and any alternatives.

4. An interdisciplinary team meeting is used for identifying the environmental, social and economic effects of implementing the proposed action and alternatives.

5. Completed EA is given to the decision maker. Feedback is provided to the WAU team so they know what, if any, data gaps have been identified and which are crucial and need to be filled for this proposal. It is extremely important to tie the EA back to the information found in the WA.

6. The project is implemented and monitored. The WA is updated to reflect any new site-level or watershed-wide information gathered or discovered.

They have incorporated the WA process with the budget process. Each team has a representative on the budget team. Their team lists a number of proposed projects and they try to get funding for them. The projects are driven by the objectives outlined in the WA (restoration, thinnings in an LSR, etc.).

Some watershed analysis efforts in the Medford District have contracted out compilation of an environmental/social history of the area in order to fill in their data gaps.

Self-directed work teams were difficult at first. They were frustrated at the lack of progress that these groups engender - but as the team kept working together, the productivity increased. It is essential that line managers provide support and have patience.

The need to work with the public was another area of learning. They found, at the watershed analysis public workshops they held, that people were willing to do monitoring work and to assist in project development. Building those types of relationships increases public trust.

Their WA documents are not final. There is room for improvement and they will continually be revised. They feel that WA brought them into compliance with the

FSEIS, ROD and that, in turn, provides them with the freedom to act.

Questions from the Audience

1. **Q:** When did you bring interagency input into your process? **A:** The only land overlap occurred with the FS and they will be working with them. At the time the WA was conducted, the FS was very busy with other projects. There was no FWS involvement. FWS will be involved in future iterations of analyses and in project proposals potentially affecting listed species.

2. **Q:** Are you going to use cooperative right-of-way agreements with private land owners? **A:** They prepare a letter telling the private company that they have new concerns, they make them aware of the WA, and they try to work with them.

3. **Q:** Will you have FWS participation in the future? **A:** All the land use allocations require Section 7 consultations. As they move into the project consultation phase, they will involve FWS people.

4. **Q:** How do you prioritize projects in your WA document? **A:** Priorities will be based on issues in the watershed and meeting ecosystem management objectives.

5. **Q:** How do you incorporate the input of outside groups? How do you do internal or peer review? **A:** They send their work to other WA groups, to the Interagency WACT and to their State Office, but they would like more peer review.

6. **Q:** Have you had any EAs go through yet? **A:** No, but there is one coming up on a timber sale and it will be their first trial. They have also prepared a NEPA document for the adjustments they made in their riparian reserve widths. Some of their adjusted widths are larger and some are smaller than called for in the FSEIS. Where they proposed to shorten the buffers, interdisciplinary field reviews were conducted to ensure that they didn't affect the terrestrial species. They looked at slope stability, and it was felt that buffers in some areas should be much larger than what had been originally established. This project is currently under appeal, so we will see how it fairs.

7. **Q:** Were buffers decided based solely on ecological conditions? **A:** Yes. There were field reviews by wildlife/fisheries biologists and hydrologists, who decided what types of buffers should be applied given the objectives of the ACS.

8. **Q:** How were tribal concerns incorporated into their WA? **A:** They have not done anything as of yet, but they plan to contact tribal governments.

9. **Q:** How has WA changed the type of projects you do? **A:** Not much. Many of the projects that were on line are now being implemented with some modification in size, location or type. So not much.

10. **Q:** Will you be mapping these riparian areas in GIS and tracking them to check your assumptions? **A:** They have only one GIS specialist across seven watersheds. They will track the area as they have in the past. They would like to get to GIS and they will, but in the meantime, they feel comfortable with their current methods. They recognize the need to have more methodology.

11. **Q:** How do the projects track back to the WA? **A:** Their WA team has not disbanded. They meet every 2 weeks and work on issues. The document is in a 3-ring binder so they can add and remove items. They use the document all the time.

12. **Q:** How is WA being received in southern Douglas County? **A:** Glendale has a population of 300. When they hold a public meeting they get 2 - 3 people. They had 35 people show up for a WA meeting. Concerned citizens, environmental groups, and industry representatives attended. It was a positive meeting, everyone was there to learn. Many individuals wanted to get involved with inventories and monitoring. They asked people if they wanted to adopt a watershed and got a lot of positive response. Now they will go back to neighborhoods and present what they found in their specific watershed and show people how they can get involved in that watershed.

13. **Q:** Your scale is smaller than the pilots, is that why you have not had a lot of outside group and interagency involvement? **A:** They will be doing more coordination, and it will be easier now that they have a better understanding of what the whole process is like.

Their manager empowered the team and encouraged them to stay together. This support makes the watershed analysis usable and decisions are made based on it. Specialists have become more generalists and the interaction among specialists has been positive and rewarding.

Shifting from looking at timber output to taking an interdisciplinary look at systems has been extremely positive.

14. **Q:** Did the Federal Guide influence them very much? **A:** The guide presented them with ideas and challenges.

They originally followed BLM's landscape analysis guidance, which parallels the Federal Guide. Ultimately, they did not want to turn their document into a scientific document that would never be used.

Agency Panel Discussion

Theme: Sharing our visions for the future -- integrating watershed analysis into our daily work.

Dave Caraher - Forest Service, Regional Office - Region 6 - Portland

There is a fear that we have done similar things in the past and they have failed. We need to make WA a success. We need to be able to do this readily so that it can be effective. It has to be easy to use. We need to improve the utility of WA. WA is so fundamental that there will be no turning back.

Jack West - Forest Service, Klamath National Forest - Region 5

The question is not how can we integrate WA, but will we? The pendulum is still swinging and that is OK. Change is OK. We have to take responsibility for the Plan and make the Forest Plan work. I do not want more direction - I like the freedom and flexibility that WA provides. We need to show how WA links to ecosystem analysis. WA is too functional a term. WA is a tool to be used to promote ecosystem management. We need to feed these new ideas back to the Washington Office and encourage them to think about the budget in terms of ecosystem processes. It is up to field-level line managers to make the public aware that the analysis is a visibly useful tool. We need to demonstrate how WA links to different scales - both smaller and larger.

Ron Eggers - Bureau of Indian Affairs - Portland

BIA is a newcomer, but they have appreciated the involvement. On page 55 of the ROD, there is a section on Tribal treaty and trust rights for WA. The Tribes and BIA feel strongly about the processes taking place on federal lands and they have a distinct interest in the way planning is done. While not all Tribes have treaty rights - they have significant rights related to historic use and off-reservation rights. BIA has a limited staff, and it is hard to comment on everything, but they try. They serve as a resource for Tribes. Tribes were not included in FEMAT. Tribes want to bring their lands into compliance with the FSEIS as much as possible. Work with the Tribes!

Dave Somers - Tribal/BIA Representative on the Watershed Analysis Coordination Team

There are many diverse visions for WA among the Tribes. The Tribes have recommended an ecosystem approach for a long time. The Tribes encourage and support activities that result in on-the-ground improvements. They want to see the best science used and they want to see it applied at the ecosystem level.

The Tribes understand natural resource management. They manage fish and forests. They want to see decisions made through WA that benefit fisheries and wildlife. The Tribes have a great deal of information that can be used in WA. When you involve the Tribes and share information with them, they will be more likely to support your decisions. Adopt a common language. Talk about similar things in the same way. The ESA, CWA, the Growth Management Act and non-point sources of pollution concerns should be addressed through WA. WA can provide these varied efforts with a great deal of information.

The Tribes want some consistency among and within agencies in defining what success is in watershed analysis. In order to develop credibility, you need to develop common expectations and measures of success.

Bill Bradley - Bureau of Land Management - Oregon State Office - Portland

The integration of WA into our day-to-day processes and relations is extremely important. Managers need to be involved in the very beginning of the WA process in order to set objectives and to make decisions when decisions need to be made. A functioning feedback loop is needed so that all of the different players are aware of new information and changes that need to be made. Trust must also be developed between the regulatory and land management agencies. It would be helpful to have regulatory people involved in province-level planning. BLM needs to do more work with private landholders. We need to explain to private landowners how we will use their information. We must also honor the Tribes and their rights. It is also critical that agencies develop consistent data standards. We are empowered to deliver - simplify or die.

Ron Lee - Environmental Protection Agency - Region 10 - Seattle

Lee commends the WA teams for all the work they did. We cannot succeed unless we all work together. For agencies with less resources, recognize that their absence from meetings or WA teams does not symbolize a lack of

interest. The EPA is taking folks out of their own base to work on the President's Forest Plan.

There are CWA and WA similarities. EPA needs a watershed/ecosystem approach - their old way of doing business no longer works. Nonpoint sources of impacts can be best addressed through a watershed approach. WA groups are addressing water quality issues and identifying ways to solve them, and they should be commended for this. We should look at entire basins and then at the watershed level. EPA will try to better communicate the CWA requirements so that they can be integrated into the WA process. This integration and effort will be supported by the Tribes, States and the public.

Vicki Campbell - U.S. Fish and Wildlife Service - Olympia

The FWS sees WA as a building block of ecosystem management. The FWS encourages a scientifically rigorous process that results in functioning ecosystems.

The FWS will integrate WA into in their Jobs-in-the-Woods, FERC, Section 7 consultation, and Section 10 habitat consultation processes.

The FWS has staff of varying expertise assigned to implementing the President's Forest Plan. It is a priority, but there are only 20 biologists and they are all overworked and underpaid. It is important to involve these individuals early in the process. They will be placing more staff across all three states; however, they do have FTE ceilings that must be addressed first.

WA will move us to ecosystem management. The FWS would like to see the development of a scientifically rigorous watershed analysis process.

Bob Korfhage - Bureau of Land Management - Glendale Resource Area Manager - Medford

Managers need to make everyone understand and take ownership in the WA process. Everyone needs to contribute, everyone needs to read the documents and teams need to be empowered and encouraged to be watershed stewards. We can integrate WA into our day-to-day processes, and this will result in more well thought-out projects and improved NEPA documentation. WA can be useful in updating plans, educating our publics on our responsibilities, and WA is an opportunity to establish partnerships and improve our credibility with our customers. The energy that has been generated up to this point is very important. The interim guidance was very useful. The pilots did a great job and the non-pilot projects will use their information.

Elizabeth Gaar - National Marine Fisheries Service - Portland

We have the same goals as the other regulatory agencies. WA can be used to meet the needs of the ESA and the information requirements of Section 7. It is so important to have scientifically rigorous sources of data. In the past, it has been a painful process. Doing research and analysis first and then proposing projects is a step in the right direction.

It is important to have a consistent approach to WA and to bring it up to a level of scientific credibility. NMFS has identified representatives to the province teams. They hope that with more involvement, they will be able to make better regulatory decisions. They are participating in the WACT and they want to put more folks in the field. They have been consulting on PACFISH. WA will be a stronghold of information on the eastside, and the eastside is looking over here to see how it is working. WA has to work. We need to get private landowners and others with expertise more involved in the WA process. If we do not get involved in private lands, then we will not get any further with ecosystem analysis. Fish do not recognize boundaries. What you are doing is great.

<u>Questions from the Audience</u>

1. **Q:** Native Americans have a lot to contribute to WA. How can we gain more information from Tribes? **A:** The Tribes have developed excellent technical staffs and we need to contact them. There are a number of projects going on and they intend to be involved in the PIEC very closely. People in the field need to seek this information out and make the contacts. Tribes are not funded to do the work yet, but they are working on it. Line managers need to develop relationships with Tribal leaders and establish government-to-government relations.

2. **Q:** Compliments to the different presenters. We need to recognize the difference between cooperation and partnership. We need to foster partnerships. There seems to be a need for training and there does not seem to be much of it available. If line managers need to make decisions about what a good WA is, are they going to be trained to determine what a good or complete WA is? **A:** The Forest Service will be offering more training. The sharing of information that has taken place here is important, and has to continue. We can send everyone to school but until they get their hands dirty, they will not learn. There are plans to develop interagency watershed analysis training following revision of the *Federal Watershed Analysis Guide*.

3. **Q:** FEMAT and the SEIS did good large-scale analysis, and WA is good because it fits into our current administrative boundaries. Now how do we do the province level successfully? **A:** The leadership has to face the problem of having so many committees - but the bottom line is to improve ecosystem management in an interagency manner. Regional executives need to get the message that we need to better coordinate this. Analysis at the larger scale is essential - we cannot fail to do it just because it is difficult. WA would benefit from province-level analysis and, in the reverse, can be a building block feeding back to the province level.

4. **Q:** You say you want more interagency cooperation and more scientifically rigorous processes. We are also told to get things done in a two-week time frame. WHICH WAY ARE WE GOING TO GO? **A:** The timeframe is not the critical issue to the Tribes, the product is. However, if the process is not efficient, WA will be killed by upper management. Two weeks is not the FWS goal either. Take the time you need to do it right. If WA doesn't adequately support decision making, then it will have been a useless exercise. Unsupported decisions that therefore cannot be implemented are no decisions at all.

5. **Q:** To what degree is the BIA developing the ability to speak on behalf of the Tribes? **A:** They are not going in this direction at all. BIA wants to provide the Tribes with the funding necessary to speak for themselves and govern themselves. Treaties are the Supreme Law of the Land, and Tribes need to be treated as sovereign nations. While there may be some commonalities among Tribes, they are all distinct. The Federal government's Trust and Government-to-Government responsibilities make it imperative that we seek involvement and input from each potentially affected Tribe.

6. **Q:** There is a fear that people are waiting for a top-down answer. When do we get to a point where checkers do not have to check checkers (e.g., biologists at FWS checking BLM/FS biologists)? **A:** The FWS wants to bring their expertise to the WA process to help make it even better.

7. **Q:** Are we putting ourselves between a rock and a hard place? We are told to go forward with existing data and then told to do rigorous science, how can we do both? Where are the funds to collect the desperately needed data? **A:** Determine what data you need. You need to start somewhere, so use existing information to find out where you want to go. We are not done with WA. WA is ongoing and we will do it for a long time. Hopefully, data gaps will eventually be filled. There are a lot of different expectations on what the product should be. Until the agencies agree on the expected products of WA, we are going to flounder.

One product should be the identification of crucial data gaps and funds should be provided to fill them. We need to get specific about what the data and monitoring needs are. Gather all the information you can and do it with rigor. You cannot plan actions if you are in data-poor situations. Decision makers should proceed conservatively where we have data-poor situations and evaluate the risks when proceeding. It is going to be hard to say you are protecting the area when you proceed with little information. Network with a variety of sources before assuming no information exists.

Closing Remarks

Meeting highlights were summarized by Bob Alverts (BLM Oregon/Washington State Office) and Dave Caraher (USFS Regional Office, Region 6).

Workshop Report Part II - Topic Workgroup Reports

The following reports summarize the structured workgroup discussions of specific topics relevant to each day's theme. Workgroups were comprised of no more than 40 participants and were designed to capture the collective experience and ideas of each group. Summaries of each workgroup topic are a consolidation of the dual sessions held on each topic.

Workgroup T-1
The Analysis Process

Moderators: Bob Ziemer and Melissa Marosy

General Comments

Many different groups have an interest in Watershed Analysis (BIA, BLM, USFS, USFWS, EPA, NMFS, etc.), but it has been difficult to get the various agencies to participate effectively.

Of critical importance to address the right questions is team make up. Should not have too many team members of the same discipline (for example, there were four fish biologists on one pilot analysis team). Other teams had wildlife biologists and ecologists involved. In general, there doesn't seem to be a shortage of biologists on the teams. But other terrestrial "ologists" may be under-represented.

Many of the analyses are being project driven, not analysis driven.

Line management must commit their people!

The Federal Guide should set some standards on what is needed to complete the WA, such as who should be on the team and what the product should be.

Some standardization is coming from data standards being set by REO interagency groups.

We need to keep the process as simple and un-bureaucratic as possible. Stay away from too many reviews by layers (in state/regional offices, Washington, D.C., etc.). Which means some diversity at the local levels.

What is the likelihood of getting all the skills we need at lower levels of the organizations (for example, the lack of social science skills at the district/resource area). In general, many of the journey-level skills for a number of disciplines are not found at the district/resource area. Be cautious of placing people with scarce skills, but who do not know the area, on the teams.

Skills needed are dictated by the situation. Some areas may have core teams and add additional skills as needed.

There needs to be a way to flag locations where there are a lack of skills. Region was depleted of rare skills rather quickly just to cover pilot WAs. So far, this problem hasn't caught attention at the higher levels.

We may be able to contract out for some skills rather than having to hire new people.

Protection of "my program" in the budget process, including targets, is still a major drawback to getting the right commitments.

We have knowledge base, can retrain folks, etc., but need to bring together different agencies (forests) to have a common protocol under one President's Plan.

What kind of analysis could you do in two weeks? Timeframes depend on the scale and complexity of the watershed. Public involvement would be impossible in a two-week WA.

Shouldn't have a time constraint on the timeframes (example of medical exam, don't set limit on how long the doctor can examine you). Shorter ones are OK if you build on them later. Too much time and money can be as great a hinderance as too little time. The important information can get lost in the mass of detail generated by teams that have too much time.

Realize that if you do a short timeframe WA, it may be limited in its usefulness, but that may be appropriate in some cases. Also, there may be areas where there are few alternatives for management decisions (e.g. President's Plan allocations).

WAs are usually being driven by some management purpose, so that will at least tell you what some of the issues are. However, stopping with those issues identified by the agency management objectives would be a grave mistake.

Starting a WA and starting the public involvement process should be tiered to the President's Plan. Build on it. Public should already be aware of the need for the WA through that process.

Many different understandings about why and how WAs are done, especially across the agencies (especially the regulatory ones).

Costs of doing WA: Growing concern about how much it costs to conduct one. Wide variety of estimates. Pilots were funded, but what about the future ones? How many levels of plans do we end up with? Who asks about cost of doing EAs? Should be same for WAs.

WAs should lead to more scientifically-based forest plans than in the past.

Bureaucratic review has skimmed off money that should have gone to the ground WAs (REO, WACT, etc.). Four or five levels of review to fix a data error is horrific.

Key Questions

Is there a difference between questions and issues? Issues may not be identical to key questions. Broad purpose is to understand processes. Obvious and well-known issues should be used by the team and others can be identified as the team goes through the process. The watershed should tell us what those key questions are, unlike EISs and forest plans that get their issues mainly from public input.

Example of issue... declining species in Middle Eel River. Key questions were more specific, such as... what are the specific factors limiting the specific species of concern; historic range of conditions; socioeconomic influences in the watershed, etc.

One problem was that folks want to jump to questions prior to issue identification.

Can't separate questions from the specialist who is looking at the watershed (i.e., the specialty of the person colors the questions that person asks).

WA is telling the story of the watershed. But that doesn't necessarily meet the needs of the managers.

Find out how the watershed works; issues come in later as the political portion of managing the watershed.

What are the overriding expectations? If they are not kept in mind, we can keep compiling data all year with no idea of how to use that data.

Historic process and capabilities have to be understood to meet the obligations that we have (e.g. fish numbers for the Tribes) under various laws.

Little hope of describing the whole ecosystem, so key questions can focus the analysis.

Analysis and synthesis led one group to their issues and key questions.

There was difficulty with deciding how to sequence steps 1 and 2 in the Guide. Movement of DFC from step 1 to about step 5.5 helped clarify the needs for issues and questions for Wallowa Whitman NF. Issues were very broad followed by many key questions.

The Nestucca team made a cut at DFC to get public involvement.

Articulation of goals is missing. If DFC provides that function, they may be useful up front. An example such as "provide an ecosystem that is well balanced" is so general that it does not provide much information that is useful.

Some folks wanted to skip the issues and let the analysis tell them what was broken rather than focus on specifics. Got public input first and got a laundry list of issues, such as 1.5 million visitors per year. Never refined long list of issues. Two pages of issues were covered with five key questions.

Nestucca view was that key questions were not needed. They found a lack of clarification of what this step was to do. They thought the meat was in the condition of the watershed.

Instead of issues, the Siskiyou team looked at the values in the watershed to determine if they were subject to change. If not, they were not included.

What makes an issue an issue?

DNR asked "why are we doing this exercise?" Don't the key questions and issues drive the process?

Pressure seems to be to produce projects from WA.

Need to keep project-level and WA-level analyses separate.

Cynical viewpoint is that we have developed a process to justify what we wanted to do from the beginning. Of the two pilot presentations, one had a product orientation, while the other focussed on planning without a view to products.

How do you know when you have done the core job? Without issues/questions, the job will always be open-ended.

Public values drive the process. That is why we are being asked to manage the land. The challenge is to understand "which public?"

Blowout Creek approach was to handle the resource issues first and then lay on the social issues. They made a purposeful split of "science" v. "social." Line perspective was that this approach clarified their decision space. Blowout Creek was targeted to get 1,100 acres of management (social aspect), but science found 1,500 acres. Project opportunities were being missed because they were not seeing all the interactions. The Blowout team was challenged with..."I bet you used the social values to determine the resource values to be looked at."

Mendocino NF identified four biological and two social issues. Looked at the biology of the land and its resources and then tried to figure out how to best handle the social issues. Concern that the term "resource" was pretty limited historically. There is a need to broaden that definition.

The Naches pilot found that many issues collapsed into a few. Merging physical and social issues was very difficult.

Recognition of the need to keep synthesizing multiple issues down into a workable set.

Jumped into the data thing right off. Went out to gather data and learn. Found out that was too much. Then they backed up... got that out of their system and redefined the actual needs. Came around to the idea of "5." Found them to be very useful.

How do we do this job of identifying issues, etc., without adequate budgets or staffing?

There is a feeling that key questions should not need to be Step 1. Never closed the chapter. Kept it open to the end.

Every situation is different. Process is general enough and broad enough to cover the range of conditions. Keep the process flexible.

Don't get hung up on which step you are on. Do your best and then move on. May not be able to get line management involved. All issues revolved around protection or use of resources. Wanted to end up with a sustainable landscape. Tried to avoid being value-ridden. Elaborated on the iterative nature of the process... not linear. Generated issues/questions then reflected back on them later in the process.

Everyone had problems with identification of issues. Suggest better identification of what is an issue or what is a key question. Another viewpoint is to put one sentence in the Guidebook that says, "...identify the issues and questions and then move on." Four pages were too many. Should have been a 2-hour exercise (Nestucca).

Instead of linear... think oval. Get rid of the word, "step." Use elements of WA. Get rid of the numbers, too. Everybody struggled with it. Six Rivers dumped the idea of key questions. How did they focus on what to analyze? Focused on processes. Spent a lot of time wordsmithing something which they knew they should do all along. Suggest that key questions should not be part of the process.

DNR suggested that there should be a list of region-wide questions. Need them to be able to describe and determine when we have accomplished the task.

There is not a feeling of acceptance of the key question concept within the group. Generally felt to be burdensome and a major time consumer.

It was still important to ask the questions, even if they could not be answered.

People are doing the job, even if not as explicitly. They are mentally focusing on the important things.

<u>Do we just ask the questions or do we have to answer them?</u>

If you don't track the key questions, you can't make recommendations. Which leads to the question about whether we should be making recommendations.

You need to use the WA to make biological opinions for management to use in political decisions.

You may identify those questions that you can't answer at this time but need to answer later.

WA should guide management in the watershed by telling the manager what would help the watershed and what would hurt.

The science, GIS, and product must let managers make good sound decisions, which is what the ROD said. Don't filter out science early based on social concerns; let management do that.

<u>What does the document look like? Who is the audience?</u>

We are writing these documents to allow managers to make good decisions. They are the only audience. Managers and agencies are the primary audience.

Writing for the public provides a wonderful learning tool. Write so they can understand it. Six Rivers has had more feedback from the public than any agency.

BIA viewpoint that the first responsibility is to the Tribes; the public is secondary. Tribes hope to be able to use the documents to help them, too.

Succinct definition of management recommendations needs to be part of the document.

Documents range from 50-150 pages in length. This is a tool. Should be in a loose-leaf binder. It is a working document for *us*, no one else. Generally writing for the district ranger.

Need to have an interdisciplinary review of the data to see if it is truly needed. If it doesn't add to the links, who needs it?

Whether it's 20 or 100 pages, if it doesn't answer the question, "SO WHAT?", then it failed. Need to have the punchline very evident in the document.

Useability and readability are important. Concern that the public will get the documents and use them against us. Need to have a solid report; length is irrelevant.

Folks generally followed the outline in the guide. Some followed a timeline. Few organized by issue.

There was general agreement that the documents did not all need to look the same. Is review a concern? Probably more differences at first... we will get good and bad examples sorted out and this will lead to a more uniform appearance.

People would like to see examples. Want less direction. Don't want specifics of report outline. Some folks need a list of how to do it; others want to use their brains. As long as we all know what we are aiming for, it doesn't make much difference how we get there. The Nestucca pilot was given a license to deviate if needed, and the team appreciated the freedom.

It would have been easier to write the document if they had known that managers were the primary audience.

When is it done? Support was given for the line officer as the person to declare, "OK for now." It is their responsibility. Concern that line officers are not up to speed on the process. Executive summaries are a trap... we want the line folks to read more than that. Proposal that there should be some baseline requirements for what is in WA to make sure that any line officers who want to charge off on their own are required to get at least a minimal amount of information.

Expression of concern about the disclosure of the degree of rigor on how conclusions were arrived at. Need to tell the people how you got there. Blue is blue, whether or not you identify it in the field or if you get it from aerial photos.

Guide Suggestion: Need clarification of who the audience is but leave the document format flexible.

The degree of critique from the public will be a function of how you phrase the observation or conclusion ... words are important. Pointing fingers is a real concern and caution.

Scales

What is the issue? What is the question? Scales depend on the subject being discussed at the time.

The Northern Spotted Owl issue requires looking beyond the watershed boundary. True for most terrestrial issues, especially for consultations. We have to try to look at what we think is the proper scale and trust that some other analysis on a bigger scale will take that into account.

NMFS uses smaller scale to look at anadromous fisheries issues. How do they tie to WAs? Not sure.

Fifth-field watershed scale lacks ability to help in recovery of species over large areas, but may be appropriate for the project-level steps in implementing that recovery.

Absence of Basin Analyses are a factor in the WAs. Hard to do a WA without knowing the context within the next larger scale. Otherwise we are micro-managing. Could do a quick basin assessment to give context to the WAs.

What is the appropriate temporal scale? Again, depends on the resource. What is relevant to today's problems. Natural range of variability is a good one for some things. The things that we can affect most are what we should focus on, given the reality of budgets and political atmosphere. What is it we are trying to affect? Prioritize and deal with those issues.

NMFS looking at four fish cycles (16 years) to affect changes. Doesn't coincide with this year's budget or the current administration's goals.

Nestucca analyzed 160,000 acres. Started with the idea of doing analysis on 39 sub-watersheds and then combine them. Quickly ruled that out. Looked at the entire basin.

Some stratification. Some folks say that is too large. Chewuch analyzed 300,000 acres. Kept it large. Ran into issues when trying to make specific recommendations. Mendocino is about to embark on an analysis of 350,000 acres.

No one scale works for everyone. What scale works for most? Those not satisfied can expand or contract as needed. Some touchy issues make it necessary to isolate the scale... implication that it would be smaller rather than larger.

No one but Blowout Creek and S. Fk. McKenzie provided site-specific recommendations for riparian reserve revision. The impression that the purpose of WA is to establish riparian reserves needs to be clarified and corrected.

Gifford Pinchot is looking at valley segment types to help refine riparian reserves. They will probably be broader rather than narrower.

Wildlife needs to be involved in the WA to make sure that species needs and connectivity are recognized.

S. Fk. McKenzie did not accept the premise that there was not enough information to make a decision on riparian reserve revision at the watershed scale. Criteria for interim widths (five) are clearly laid out in the ROD and are generally outwardly expanding. Their approach allowed them to make recommendations based on function related to these five criteria. Incremental approach allowed them to get a picture of what was needed and avoided gridlock... (inability to make recommendations for change). Biggest changes came from Class IV intermittent streams. Many have no riparian areas associated with them (tight definition). Slightly narrower overall. Wider in some areas, narrower in others.

BLM (Nestucca) has taken the position that management is not eliminated in riparian reserves. Rather than spend a lot of time worrying about how to modify them, they spent time describing guidelines for how to do management within them.

Wallowa-Whitman put time into looking at larger scale issues and listed them in the document, but did not feel that they used the issues to help the process.

There was an attempt to say that WA at 350,000 and at 24,000 acres are comparable. The group rejected this notion. The products will vary by issue and will provide the same utility. Six months spent looking at 350,000 acres will produce a different result than six months spent at 24,000 acres. How will the public know what the analysis is worth?

There are some questions which are handled better at different scales, such as species viability. [There was surprise about the statement that species viability should not be considered at the WA level. It has been done in FEMAT (per Cay Ogden). Tried to clarify that this is based on the area covered by FEMAT, not appropriate to the eastside, non-owl forests.]

Scale is critical for determining the ability of the State to interact with the Feds. The different objectives of the two agencies seem to be dictating different scale and analysis intensities.

We need to clearly explain our choice of scales in the analysis process.

Other Agencies, Public Participation, etc.

EPA and USFWS have participated in some WAs, although electronic communications have not been worked out very well. Management agencies would like the regulatory agencies out in the field. USFWS is reorganizing, which could result in more people to help with WAs up front.

Commute distances and time are limits for many SCS, USFWS, and EPA people, because their office locations are usually far from the field.

BLM and FS shared-ownership watersheds are a good opportunity for information sharing between these two agencies.

EPA has worked on a few of the WAs. Don't have the people to do all WAs. But EPA has a few positions identified and want advice on how they might be more involved in the WAs. Where is the most effective place to be involved? What skills should those people have?

The issues stage, key questions stage, and analysis stage are where regulatory agencies could be most helpful. "Ologist"-types may not be the most needed skills to supply to the WAs. Other agencies have many of those types.

For the Tribes, issues, synthesis, and review stages are a good place to get involved. Tribes have the specialists if other agencies have the money. Be creative in using them.

Communications skills are critical to having multiple agency people on the WA teams.

What about EPA's needs? What's in it for them? EPA wants to address impaired beneficial uses and water quality

on federal lands during WA to help prepare response (TMDLs) for influencing downstream impairments. WA process could help with aquatic restoration, which will be a major focus in the future. EPA starting to reorganize based on ecosystems (watersheds).

Interagency cooperation on WAs has opened communication lines and finding of overlapping efforts.

Priorities of doing the WAs for the individual agencies may be changed based on priorities of the other participants as a cooperative effort. Pooling resources.

NMFS may use the WAs as a basis for recovery plans in future consultations. They want to participate early so that their concerns are in at the beginning.

Tremendous opportunity for the land management agencies to implement the laws like ESA, Clean Water Act, in conjunction with the regulatory agencies. Limited resources means we must get rid of some of those barriers that are institutional to allow cooperation between the management and regulatory agencies.

Research institutions can be similar to the regulatory agencies in that cooperation opportunities exist. Use the strengths of the other agencies to get around barriers within the agencies.

State agencies are valuable assets. Trouble with FACA. Unclear on how it applies, especially as relates to WA teams. There are different approaches, but basically we should be fine if we invite everyone, especially after FACA chartering of Provincial Advisory Committees. Be creative.

Private lands are integral part of WAs, but how do we incorporate and share information with those landowners? Many landowners are choosing to be involved because they recognize their interests. They may participate more in the future if they see that USFWS won't shut them down after WAs (based on the ESA). Aerial photo interpretation has been the only access in some large private landowner areas because of their fear of what the WA will do to them. What assumptions do we use for those lands? State Forest Practices Act requirements would be the maximum management activity levels on private lands.

<u>What would we do differently?</u>

Need more direct line officer involvement. Need to check off on the specific issues to be carried into the analysis. Team leaders were specialists and therefore did not have time to do their specific tasks. Use planners as team leaders in the future.

Less time trying to prototype analytic modules and more time spent integrating and synthesizing.

Do it quicker.. don't get bogged down. Don't get lost in details

Dedicate team members. New teams will have to learn all over again. Need to make it easier to read the Guide. Use "guidance", not "steps".

Have a section that talks about roles. How do we interact? Talk about the role of the line officer. How will it be reviewed? PIEC, REO?

Develop training.

Pull together an interdisciplinary team for a one-day session to help isolate the issues and appropriate skills to do the analysis.

We gained a perspective we did not have before. Everyone should be involved at some point so that they can appreciate the value and the process. Share the wealth.

REO should develop and distribute a sense of what an average example looks like. Also, REO needs to get the River Basin assessments orchestrated--get them started and completed.

Workgroup T-2
Data

Moderators: Dora DeCoursey and Peg Watry

<u>Summary of Key Points:</u>

1. The lack of clarity of what Watershed Analysis (WA) is makes it difficult to determine and meet data needs within timeframes.

2. It is valuable to have a GIS person/information manager fully involved in team discussions from the beginning of the WA or earlier.

3. There is base information needed for every WA (example: streams, vegetation, soils) that can be worked on before the Team begins. It would be more efficient to gather those data on at least a unit-wide basis, rather than watershed by watershed.

4. There is a high cost and time commitment to integrate data from different agencies. It is inefficient to resolve this on a watershed-by-watershed basis.

5. Teams found gaps in what information was needed to do analysis. These gaps need to be addressed in our data collection planning at the Basin level. Gaps include riparian, fire history, vegetation structure for wildlife habitat.

6. The Interagency Resource Information Coordination Council (IRICC) is working to support the many individual watershed analysis efforts by providing a framework to bring all the interested parties together to define data standards. Currently they are drafting standards for forest vegetation, hydrology and fisheries. If interested in participating, call Duane Dippon (503)280-7014 or Ron Ochs (503)326-2647.

7. IRICC strike teams will be summarizing data elements used by the pilot watershed teams. Some of you completed a questionnaire, and the results are being used by these groups.

What process was used to determine exactly what data you would need to do watershed analysis? At what points in the analysis process were these decisions made? What would you do differently next time?

Process examples:

One Watershed Analysis (WA) team had a GIS representative on the WA team. In early team meetings, they identified issues and discussed what data were available and what work was necessary to produce new information. The team members were then given time to think about the needed modules and products (maps/reports). The GIS team member then had personal interviews with team members (about 2-4 hours/person) to discuss how to make their products and additional data needs. The interviews and needs assessment were done in the first month. They revisited data needs and how much work was needed in the analysis throughout the process. Revisiting was very valuable.

Once key questions were identified, another Forest had people in the various disciplines determine the needed analyses. They also reviewed the Washington State (DNR) process for watershed analysis. They used available data but also collected some new data. They assessed data needs by modules.

Another Forest also reviewed the federal WA guidelines, the FEMAT report, and the Washington State DNR process. After completing an initial watershed analysis on their Forest, they will carefully review it before they begin their pilot watershed.

To prioritize data, one Forest prioritized by modules and then looked at the priorities as a whole. One Forest determined if the data needed to be in digital form (i.e., in GIS) or not. Sometimes using mylar overlays was the solution. Some priorities were obvious, such as vegetation. This watershed analysis process has highlighted a need, and now the Forest is interested in pursuing development of the vegetation layer as a priority for the Forest.

Started by identifying issues and then reviewed what data we already had that matched those issues. Assembled small group and brainstormed.

Identified what usable data they had at the same time as looking at issues. It was a brainstorming-type of process.

Identified what the key questions were to determine what data were needed. Went through a lengthy matrix and narrowed it down. From 1,800 down to 66 questions through the matrix process. The strength was that the matrix didn't allow key things to be ignored. They had seen other teams work this way and followed it.

They looked at the process as determining what overall ecosystem/biological processes are occurring, not from looking at the projects.

Modules from the Federal Guide were used very heavily. They then narrowed it down through brainstorming. Then looked at the data that they had. Used the module as a checklist. Hard to focus in the beginning.

Who used the Federal Guide?

Most tried but didn't get very far. The guide was not helpful for some. The modules did not always fit. In their first brainstorm effort they came up with a lot of ideas, and then they realized that they were not issues in particular. However, the process led them to identify issues they hadn't thought of.

The terrestrial and biological modules were basically non-existent.

The fish biologist used it and liked it. However, it doesn't work if they don't have a database to start with.

Alaska - they used the WA as an opportunity to collect data to use as an inventory tool. They used existing data, but they used them to gain a great deal of new information.

Observations:

The lack of clarity of what is entailed in a WA hindered the Information Needs Assessment (INA) process. Time was spent figuring out what a WA is and what to do. Answering questions seemed to bring up more questions.

It is difficult to determine data needs when issues are broad. It is hard to pinpoint specifics from broad issues and questions.

Determining needs is never ending. One cannot expect a one-time shot to determine needs. Data needs continue to come up throughout the steps of the process. Data needs change as issues, key questions and watersheds change.

Lots of data were generated for the watershed analysis, but management support is lacking for acquiring data unit-wide, which would ultimately be a more efficient way to do it.

Every watershed is different as the issues and key questions are different. There may be some base layers needed for all watersheds such as streams, vegetation, etc., but each watershed's data needs are unique.

The size of the watershed is a big factor in determining a data needs process and timelines. Managers need to be educated on the time it takes to do a 150,000-acre watershed versus a 25,000-acre watershed. The larger the watershed, the more intense an INA is needed, and the timeline needs to be increased to acquire the data and integrate it.

There is a need for data standards.

Ideas that can help:

Establish a system to learn from the first teams that floundered through watershed analyses--what worked for them, what can be standardized, what they liked--and share this with future watershed analysis teams.

When identifying issues, also provide information on what data (including quality and format) are currently available. At the beginning of the process, take a forward look to determine what data, quality and format will be needed and the amount of time it will take to acquire, collect and edit the data.

Early on identify key or core data that can be worked on/compiled from the beginning--e.g., landforms, streams.

Have an information or GIS manager on the watershed core team from the beginning. (In our discussion group about 2/3 had a GIS person on the team.) This allows the individual to hear the discussions, ask questions, and do some GIS/information management education.

Fully educate the team as to what GIS can do and what it can't and how one can best use GIS. Do some one-on-one education with team members on information management and GIS if needed.

Resource specialists should spend some time in GIS to see what it can do and start playing around with it.

Use information request forms for desired products or at least have discussions with the resource specialist about requested products.

Make data needs decisions and acquire data before the field and fire seasons start.

Get managers involved right up front and have them decide what level of detail they want.

Spend time in the field and get a sense of what the watershed is like. If you don't have numbers, then you can get qualitative data. Go out as a team.

Very difficult to collect data for only WA. Have folks deal with the information needs of the whole Forest. Don't simply focus on the production of documents. Can't ignore the information needs of the whole Forest. Try to dovetail both needs and parallel these efforts.

Have a data coordinator. Collect all of the information and coordinate this information gathering. Specialists do not have time to do this. ***One Forest developed a data manager to handle this function.***

One Forest asked people who had nothing to do to do data gathering. They did not have information on private land and they developed a data base.

Try to get people to define roles - what does everyone have to do? All of the information came at the same time. Need to do an Information Needs Assessment (INA), get a clear idea about when things are needed and who will be responsible.

Before you bring a team together to do an INA, you need things like stream surveys, etc. Get that basic information that you know you will need, and that you have around, and get going on that.

Have outside agencies on board in the beginning, since they have information and data that would not have to be

duplicated. They can be given tasks and they can have different/beneficial perspectives.

How much/how detailed are the data needed to complete a watershed analysis? (This is an issue of balance between level of detail and time available to get the job done.)

First, the key questions need to be clearly defined. Until one knows clearly what the question is, one cannot determine the appropriate level of detail.

Need detail in stream data down to intermittent streams and the "segment" level.

We tend to build our data sets at a 1:24,000 scale. Even if finer data are available, we lump them up to this scale for use in watershed analysis.

One group had a 340,000-acre watershed (which they felt was more akin to a basin) and used a 100-meter resolution. They used 1:63,360 and 1:100,000-scale data for that area. They used a finer resolution--10 meters--in riparian areas, where the questions demanded a finer level of detail.

Depends on how the results of an analysis will be used. The expectation is that results of watershed analysis will feed NEPA and make that process easier. Managers should not expect that they will provide enough detail to do prescriptions on riparian reserves.

Teams want detail needed to respond to questions in FEMAT.

Need to realize that we have always collected data. Now our direction or reason for collecting is different. Existing data may not fit what we need.

As we involved more agencies, the level of detail continually changed. Depending on who is involved changes what level of detail is needed. This could be part of a risk factor. Some managers may need a great deal of detail to risk and some are willing to take bigger risks by having broader data.

How much information you have about the different resources and populations/species should determine the level of detail. Some areas are void of information and some are weak. Even if we have information on specific species, we may not understand the linkages.

Started listing vegetation attributes. There are key attributes that you can focus on to develop the ability to do these large-scale analyses. Top ten vegetation attributes:

- species composition, understory/overstory
- age
- vertical diversity/how many layers
- information in non-timbered stands--wetland, riparian, dry fields
- snags/dead down
- insect and disease
- cliffs/rock outcrops/standing water

Knowing vegetation types doesn't mean we know habitat types. While they may be related, many different types of associations need to be factored.

Admit that we don't have information. The public is comfortable with that; just say that. You can't go do a project but you can continue your WA. **Is it really OK to say we don't have this information? At some point you have too many gaps. Maybe say that we don't have it, but identify that you will get it and get it by a certain date. This, however, then brings up the issue that when you get to small, site-specific actions, then you still need that big-picture data. We need to tackle this issue of data-poor areas. Need help gathering data where we are data poor. Use restoration funds, out-of-work folks, in this data gathering.

What essential data for watershed analysis were lacking? How did you cope with this? How did data availability and quality affect the analysis?

Some available data may be collected for one purpose, but must be adapted for a different use for which they may be of limited value. Timber management-oriented vegetation data do not satisfy need for riparian vegetation data. Wildlife habitat information is derived from timber-oriented classifications.

Vegetation data needs:

We need vegetation data from the wildlife habitat perspective. Structural elements that are needed include:

- vertical and horizontal canopy layers
- hardwood corridor, hardwood mix
- community type mapping
- snag component
- dead/down wood
- remnant component
- limb size

Ideas for addressing this, which have been used by some:

- change stand exam forms to incorporate needed items

- extrapolate from stand exams to areas (although there are problems: don't have full coverage and extrapolation can be inaccurate)
- develop methods to use existing plot data
- use satellite data
- perform detailed riparian corridor transects
- use BLM yew study transect data
- use National Wetlands Inventory (NWI) data for starters

We also need more work to develop models of wildlife habitat.

Vegetation data are needed for private land. Ideas for addressing this are using air photos, satellite imagery and digital orthophotos.

Specific vegetation characteristics needed include:

- age/year of origin
- seral stage
- successional stage
- structural stage

Many units, but not all, have age data available.

Activity data can give unreliable age, due to recovery period of the vegetation.

Other vegetation data needed and not widely available include:

- plant association--series is needed for watershed level
- potential vegetation data, such as age, for natural stands
- vegetation history over time, past and future fire and other natural disturbance, human disturbance pattern within stand--dominant cover type v. ranges of ages

Need vegetation information to address:

- watershed recovery
- fragmentation
- habitat concerns
- site potential trees in riparian reserves
- snag component for large wood recruitment

Historic vegetation maps of Oregon counties, digitized by USFS, are available, but only some obtained them and found them useful.

Better T&E & Sensitive Plant Species data are needed. One unit identified priority areas for future surveys based on modelled likelihood of occurrence and risk level of areas. BLM is looking at stand exams around known T&E locations to analyze risk of disturbance and need for intervention to maintain populations.

Noxious weeds data are important in some areas. One unit surveyed along roads, another included noxious weeds in riparian survey.

Stream data needs:

Intermittent stream locations (Class 4's) are very important. Some had experimented with computer-generated locations. Most or all felt this did not work, especially due to the gross resolution of the Digital Elevation Models (DEM's) currently available to us. The general approach was to draft locations based on topo lines and air photos. Field verification is needed, but is impossible to do completely. Several felt verifying sample areas was a good way to go. One unit had done field sampling at high flow/storm periods and low flow times. Sampled within strata based on geology. Minimum catchment size for an intermittent stream was 7-10 acres.

Also need:

- anadromous, resident and non-fish bearing distribution
- gradient (better than we can get from current DEM's), productive flats
- link between USFS Stream Survey database and stream layer (some have)
- Rosgen channel classification (nice to have)
- water quality/sediment, temperature, non-point pollution, pH
- channel width changes, amount of side channels
- stream flow (may be interpreted from other things)

Other essential data missing--brainstorming:

- stable, unstable soils in riparian reserves (BLM has soil and geomorphic elements in timber data set)
- roads:
  - surface type
  - road management objective
  - road conditions
  - unstable cut bank
  - road fill problems
  - "non-system" roads
  - road information on private land
- drainage structures/culverts:
  - location
  - size/100-year flood capacity
  - function as fish barrier
  - fill stability
- activity type and when
- harvest method

- mass wasting, existence and origin; desirable to have historic and current
- wetlands, more detailed than NWI and perhaps change over time
- seeps, springs
- land use, zoning
- fuel loading
- better rainfall data
- what research has been done in the area (in a database)
- vertebrate and, especially, invertebrate species (better than we have)
- absence of T, E & S species
- fungi and nonvascular plants (survey and manage species, for example)
- natural history of the area

What did you do if you didn't have information?

Contracted with a botanist to get information for future efforts. Some had timber folks who had nothing to do develop an intermittent stream survey.

Timber harvest on federal lands was the best history they had.

Classified private land through aerial photos. POI on BLM but they might not mesh.

PMR satellite imagery is helpful but only useful on FS lands.

How did data availability and quality affect the analysis?

It slowed the process down. Decreased the level of detail. If you didn't know what was going on on private land, then that triggers some interesting issues regarding going back and monitoring.

How did differing ownerships affect the availability and quality of data needed for watershed analysis? Did you find differences in data quality/availability between private and public lands? What could be improved about how we share data between agencies/ownerships? Who is responsible? What data attributes would be most useful to standardize?

Experiences:

In Washington State there is an MOU with Washington DNR for data exchange covering some forests. It took a lot of time to arrange the MOU. It took lots of work to merge data sets of the Forest Service and DNR. They had to determine common coding schemes and interpret classifications for each data set.

At least one group had members of other agencies as an integral part of their team.

Lack of time, budget constraints and unavailability of data impacted the sharing of data between agencies. It is important to provide other agencies lots of notice so they can plan ahead for their involvement.

For private lands, some used data that were already available from USGS maps, etc. Mostly, the data were unavailable. Therefore, they used aerial photos to capture data such as vegetation data and roads. There is hope for using satellite imagery to acquire data for future needs.

Personal contacts were important in acquiring data from other agencies and private companies. Interpersonal skills are needed.

ODFW is doing stream surveys on private land.

Each agency has different views and expectations of watershed analysis--why we are doing it, what we will get out of it, what the scope of the analysis should be, and what priority the project has within each agency.

Each agency needs to learn about how the other agency (or different parts of the same agency) functions in the data management arena. For example, Oregon BLM has a fairly strict and centralized system of data entry controls, stewardship, standardization, and accuracy, while the forest service in Oregon is much looser. Therefore the BLM may not be able to move quickly on digitizing a new theme compared to the Forest Service, and Forest Service units tend to supply unstandardized data in unpredictable formats as compared to the BLM.

A Washington forest has standardized some data with State DNR.

It is most important to have common arcs (i.e., exact same digitized locations) between agencies, even if the data attached to them are different.

Locational data needing standardization:

- hydrography
- administration boundaries
- Public Land Survey System (township/range/sections)
- transportation
- watershed
- ownership
- soils

Difficulties in combining data: We use different coordinate systems. We have different system requirements.

Information would depend on the mission of the agency gathering it. Very difficult to merge the databases because they were built for different reasons. Combining means bringing data to lowest common denominator. Have to edgematch. Managers need to know that using existing data from others is not effortless.

Thought other agencies had information. Then when they got the information they found that it wasn't what they thought it was. It was hard to integrate the data - different types of data.

There are two existing wildlife/habitat associations databases in Oregon: Oregon Species Info System - ODF&W and a database from the Natural Heritage Program. It was not helpful to develop guilds, but is data and worth looking at.

There are a lot of private owners who will not give us information. Some could only get that information from aerial photos. There was a fear on the part of some that the information would be obtained by the environmental community through the Freedom of Information Act. Fear of the 4(d) Rule. This whole process is designed to build trust and improve our relationship with the outside groups and the public in general.

How can we improve?

Involvement of all of the cooperators from the beginning. Bring the State, Tribes and private industry, etc., together. Continue to do this.

The use of Arc/Info allowed the FS to use BLM info and develop a vegetation layer. Use money to map across boundaries - don't just stop at the boundary of your land.

We need to agree on the lowest common denominator.

Steve Dilly - Fish and Wildlife Service has gotten people together from each agency and they are setting core variables. Attempting to identify core key data elements. They want to stop duplicating efforts.

Opportunity: Since units of the Park Service (at least some National Parks, like Crater Lake) are just beginning GIS implementation, the time is ripe to work with them on data standards.

Issues: If we develop standards, there will be barriers to getting them implemented, such as the need for time and funding to change existing data. Better to start with interagency cooperation/standardization up front, as it takes time.

Who is responsible to do this?

Everybody. Just get a core group of people together and just start.

Managers feel this is important. However, the problem is they need to support multi-organizational positions. Job sharing. It is our responsibility to develop those horizontal positions but it takes time to do this and they don't have it.

IRICC was formed to work on this issue of interagency cooperation.

How did you integrate data across disciplines to understand how the watershed/ecosystem works?

Vegetation attributes were defined to be used by a variety of different disciplines. They sat down with the different disciplines and they agreed on what attributes they would use.

Wildlife biologists determined what they needed. Then they used these common denominators to help fisheries along with other attributes. All the different specialists got together and were told what they had and determined what they needed.

It was the hardest part for Alaska. They made a graph that showed what the fish were doing during the year and compared it to what was going on hydrologically--stream flow, etc. (Bruce Cleland, EPA). This visual was very helpful. This "forced" the fisheries specialists and hydrologists to work together.

One district took three different approaches. The simplest was a fire frequency/timber map built by hand and agreed to by everyone. Aerial photos were pulled out, and then they determined what were the largest and smallest polygons that would be needed. They identified what they thought might be out there. This measure was rejected. Then they tried to use vegetative communities against geographic systems. Then, through a literature approach, they took a general narrative approach to describe what the area was like.

A lot of the data integration occurred through an Information Needs Analysis.

Habitat patch method of Kim Mellen, wildlife ecologist, Mt. Hood NF, clumps wildlife into guilds based on lifeform out of Brown. Some assumptions have to be made in relation to the snags and rock outcrops that are there.

Fragstats was used to designate seral stages. All the resource folks used that information for different purposes.

Some types of data change rapidly over time (e.g., timber harvest/vegetation recovery; the road network/standards). How was this temporal element managed? How will the data sets be managed over time for monitoring and other purposes? How will the data be shared?

Data change:

This was a problem in Alaska in terms of the lack of skills necessary to use it.

Current information can be archived. If we want to update, we can compare it to past and see how things have changed.

One way to keep it alive will be the use of long-term remote sensing for change detection. This will be a proposal by IRICC.

Old photographs can be extremely helpful. This helped with private land to get a historic perspective on how much timber had been cut, etc.

This is an area that is extremely important. Try to incorporate this issue into the beginning of the process. There needs to be identified owners of data.

Do fire studies or core sampling to validate the data they already have. Pollen studies, carbon layers in the soil.

The Nature Conservancy is currently constructing a vegetative map for the Willamette Valley based on historic survey information.

How will the data sets be managed over time?

Things you can grab through remote sensing can be tracked, and that's great. However, what is under the canopy, and cannot be tracked through remote sensing, is extremely important and no data exists or is being discovered.

There is a fear of throwing information away.

If your Forest Plan has a good monitoring plan, perhaps you can default to it. The ROD will be coming out with a monitoring plan.

There has been restoration that has taken place and it has not been monitored.

Rather than going on to other watersheds, spend money or train displaced workers, etc., to fill in data gaps and complete the job that was started. Some have volunteered their time to collect baseline data.

How did you deal with differences between information needed for the watershed scale v. the basin/province scale v. the project/site scale?

They worked at the watershed scale when they could and then tried to interpret more localized information to the broader scale when they could.

How did you assess error in the data you used? How does data error at different scales affect the accuracy of the final watershed analysis product?

Some did not have time to assess the error.

Alaska did a quick on-the-ground survey of stream crossings and compared it to what the GIS said. They found a 30% error.

Ground "truthed" aerial photos for habitat suitability were not accurate.

One of the reasons errors were found was that the data were obtained for different reasons. It could not be used for something else, although it could be used for its original purpose.

When creating your themes, identify what the drawbacks and benefits of the themes are; show what problems exist.

Need to overcome the inability to update data. This is extremely important. The technology is there to do this. Need to get resource people to get you the information you need. There needs to be better communication between GIS people and resources so everyone understands GIS needs.

Some roads do not register on GIS that have significant impacts.

What data assumptions did you make about future actions on private lands? In what ways were these assumptions different from those on public lands?

Recognized that for lands owned by a company, their management would change based on their changing corporate agenda, so not too many assumptions were made.

When dealing with private landowners, it is hard to tell them that you have made assumptions about their land. Some of them have a hard time with us making assumptions about what they will be doing.

Workgroup T-3
Integrating Information--The Analysis Product

Moderators: Don Ferguson and Sheila Logan

Who is the audience for the watershed analysis? How are the results made available to these audiences?

The audience is the line officer, the public, and the managers and specialists preparing NEPA documents. The group liked the symbolic effect of keeping the document in a "three-ring binder" to demonstrate its open-ended, iterative nature. This also confers stewardship responsibility to the inheritors of the document to keep it current.

Considering that there may be three distinct audiences, maybe there should be three packages for distribution. Wide distribution would be given to a summary format for the general public, a more complete format for managers, and the fully assembled information, including appendices, would be resident on the home unit. Suggested that 10-20 pages may be about right for widest distribution, with more detailed versions available on request.

Detailed attention to a workable index is advised to ease navigation through the text.

What should the final document look like and why? How produced and distributed? Cost?

To determine content and appearance of the document, re-examine what the initial objectives of WA were. What should the document have in it to help us make decisions? Suggested that there are three steps:

- First, a set of objectives and the listing of data sources, historic conditions, current conditions, process inventory.
- Second, take this basic information and develop plausible scenarios. (e.g. what if we only implement the Record of Decision; what if we tried to interpret natural patterns and lay out inferences for desired future conditions).
- Third, say something about how the analysis and the plausible scenarios will affect ecosystem function for 150 years.

The product should have high utility for on-the-ground implementation.

Cost will vary by unit depending on quantity and types of displays. The cost of production is probably not significant considering the amount of money being spent on WA. Could provide the option of purchasing the complete package with color, maps, appendices, etc.

Separate doing the analysis from writing up the analysis...don't bind them together as this exposes us needlessly to criticism of inconsistency.

How much information and analysis is enough, and how is it best displayed?

The feedback on drafts has been "make it shorter, but add this." There were examples of credible and integrated analyses requiring from two weeks to two years to complete. Most people grieve the feeling of "spinning wheels" and "wasting time" as they delve into this new process. Different areas have different complexities, differing degrees of "data-richness" that make a "standard" allocation of time meaningless.

Team dynamics and testing of pilot procedures is time consuming. The second time through should show significant economies of time.

It is suggested that groups assemble known information and then work on key questions. More of a fire-aim-ready approach at first, to avoid the wheel-spinning and to afford a sense of accomplishment.

How can we obtain effective interagency and intergovernmental participation?

Effectiveness is achieved when you can't see the seams between agencies. Some folks felt that the BLM and FS are going in different directions and that effective interagency work is still a long way off, while others report a nearly seamless meshing of members and issues. There have been some major benefits in tapping into each other's strengths. Where most successful, this interagency work is not the first attempt at "blurring the lines," but is the reward for a history of efforts.

It was stated that the field-level response to overcoming the barriers to interagency and intergovernmental cooperation is quick; districts and supervisors' offices respond okay, but regional and state responses take a long time and manifest more differences.

Details to other agencies can help us to understand how each agency operates.

Intertribal and Intergovernmental relations are more difficult. FS and BLM are the easy ones. County-level people anticipate specifics and were more difficult to work with. Tribal efforts have varied a lot depending on

interested people being made available. Warm Springs is an example of success stemming from at least three years of information sharing and players from both groups knowing each other.

Willamette NF did a 3-day team building exercise at the outset with the Corps of Engineers, Umpqua NF and others and felt that this accelerated the subsequent processes.

How do we do WA across mixed ownerships?

The general public seems delighted to be given the opportunity. Best value is from those who have lived there for generations. Industrial owners are reluctant, fear the misuse of their information and potential negative impacts of their participation. They don't want their proprietary information distributed to the public.

Initial contact is generally through a letter with phone follow-up. Need to create an incentive for cooperation at the highest levels.

One-on-one, backyard-type meetings work well. Most people have experimented with mass mailings with varied results. Helping create a basin perspective is useful to let people see the context of our work. There is a downside when discussing the effects of irrigation on fisheries (when speaking with an irrigator especially).

At least one case of cooperation in WA with an industrial landowner resulted from an information-sharing effort that goes back several years. They were happier with the resultant analytical information than they were with their own data base.

There is some disagreement on the appropriateness of spending public money to analyze private land. Differing comfort levels. It doesn't make good ecological sense to ignore or avoid the trouble of getting data from private land.

Should WA include DFC or project objectives? How specific?

The gray area around DFCs allows us to set up project recommendations and priorities as we go. DFCs or DFC-like recommendations are a laundry list to pick from to do NEPA actions. They are included in WA as a list of opportunities.

Set priorities and some rough timelines. It is suggested that DFCs and project recommendations are the most important to management and the least addressed. A focus on projects may derive from team composition.

May need to remind teams that they can make strong recommendations without venturing into NEPA decision-space.

Following analysis and the description of the natural range of variability, a benefit/cost-type recommendation can be used to describe priorities for management opportunities.

DFCs are adequately set forth in the ROD and in allocations like LSR, and in existing LMPs and RMPs, which have undergone NEPA compliance. No need to reinvent.

Caution: the landscape needs the 200-year events (landslide, catastrophic fire...) to get to optimal. Don't try to manage in a way that prevents what needs to be there from getting there.

Analysis is done in different watersheds for different reasons. In key watersheds, it is for the identification of key risks and to maintain refugia. Describe DFCs that address the reason for the WA in the first place.

Even when tiering to the ROD and other sources of DFC information, there is still a lot of latitude when dealing in watersheds with significant private ownership where we can't affect outcomes.

Just because the land is matrix, doesn't mean it's open season for cutting. There are still a lot of plan layers to go through. Must state what you feel the land can support. You can tell folks where you think they've gone wrong and where they have to stop.

In summary: this is where we're within the range of variability, this is where we're out, and this is what we need to do to get back in.

What should we do differently next time?

I'd wait until now to start! The rough ground has been plowed.

I'd document the process better.

I'd make greater effort to seek the knowledge of peers and colleagues.

I'd shorten the issues identification process.

I'd insist that the (ranger, line officer, area manager...) sit down with the team during the issues identification process. They are now claiming that they haven't been involved.

I'd postpone issues identification until current conditions have been identified.

I'd have other teams more involved with making recommendations, rather than having other managers looking at it. Regional levels need to identify a process for peer review to provide consistency. Who are these peers anyway?

I'd establish consistency between FS and BLM in WA approach.

I'd provide issue identification to the team up front to save time and replication.

I'd not undertake organizational reform (downsizing, restructuring...) at the same time as undertaking a new analysis process.

Workgroup T-4
Synthesis of Individual Disciplines

Moderators: Chris Park and Callie McConnell

Interdisciplinary Watershed Teams

Watershed analysis provides a forum to integrate current research technology and processes in a focused effort. It lays out the information on which to base a management action. Watershed analysis is the front-end work for the next NEPA project. To identify the key issues within a watershed and then to understand how that ecosystem works to affect those issues requires a complex interaction between specialists from a wide variety of disciplines and organizations. There are both roadblocks and opportunities to effective interdisciplinary watershed analysis teams.

Many roadblocks identified from the first round of watershed analysis in Regions 5 and 6 are ultimately about change: change from the old way of doing business within the agencies, between agencies, and between agencies and the public. A new process, technical and logistic challenges, and unclear and changing management expectations are just a few examples. Many opportunities are about progress toward a more integrated, holistic approach to land management. Several situations that were considered roadblocks in the first round are actually opportunities leading to more effective interdisciplinary watershed teams and ultimately more informed decision-makers.

Communication and Synthesis of Information

Communication is an important skill for each team member to develop. How well team members communicate can either make or break the outcome of the watershed analysis. Team meetings set the stage for the different disciplines to interact and to discuss processes and important linkages. Team members must say what they think clearly and freely in an environment that encourages discussion. There is inherent disagreement between some disciplines and personalities. It is important that team members discuss areas of possible conflict and arrive at agreements where possible early in the process.

There is opportunity to improve communication and understanding between disciplines during synthesis, the heart of watershed analysis. Synthesis involves putting all of the parts of the analysis together to develop an understanding of how the watershed functions as a whole.

It is important that synthesis is incorporated from the beginning of the process. One method to facilitate this is to assign a team member unfamiliar with a particular field to work on a piece of the analysis with the specialist. Another effective method is to change roles and present another discipline's data. This forces people to understand other disciplines, broadens perspectives and provides an opportunity for members to communicate complex information. These methods can also help focus the remaining synthesis. Once the individual pieces have been developed, time for a synthesis phase is essential. It is missing from many of the first efforts because of time constraints.

During synthesis, it becomes apparent how all specialties are ultimately socially-based. The ROD stresses the importance of "human" in the equation. The social context can be the framework for the analysis. It can often be the most difficult to integrate with other disciplines. During the synthesis phase, there can be an inherent polarization between linear and holistic thinkers. However, the team must focus on the vision of watershed analysis and foster enthusiasm, while facing challenges and maintaining a positive attitude. A willingness to step out of traditional roles and take risks, as well as cross-training, may help. If the team is unable to deal with inherent roadblocks, then team composition should change. Selection of compatible personalities may be as important as the mix of disciplines and training on the team.

Communication and the synthesis of information can also be affected by absences or changing of team members. People may leave for a fire, become ill or leave for a new job. The whole process does not halt because of emergency or personnel changes. Data gathered and

information collected should be continually written down. Each person should take on a multi-disciplinary perspective and responsibility. The team leader should ensure that each discipline presents current findings and that these findings are incorporated by other disciplines on an on-going basis.

The final measure of success of communication and synthesis is the eventual application of the analysis: what, where, how, and when management actions occur in the watershed.

Management

A major roadblock for a successful watershed analysis is unclear direction from line officers. Many resource specialists in Region 6 feel there is a lack of commitment by Line to the watershed analysis team and process. The results are affected morale, loss of efficiency, and disagreement on what the product should look like. The team can do a lot of work only to be rejected or criticized by Line because there was not clear direction or commitment up front.

Management needs to work closely with the watershed analysis teams. In Washington State, the TFW group consisting of line officers and specialists chose to have line participation. Management participation is built into the watershed analysis guidelines, and where they are involved is clearly defined.

Management cooperation and support can be a major asset to the team, and the effectiveness and success of the watershed analysis. Managers may find themselves groping for information, unsure of how to give team direction, and waiting for direction from higher staff, such as the RO. This may stem from uncertainty on what useful information comes from a watershed analysis and how it can be used in the decision-making process. This remains unknown.

It is the responsibility of the watershed analysis team to get managers involved. Managers need to be involved at crucial points in the process. For example, set up check points at which they can monitor the progress and direction of the team. Find out what their personal interest is from a technical standpoint; for example, if it is fire history or recreation, use this to gain interest in the information generated from watershed analysis. From a Regional perspective, revise the Watershed Analysis Guide to clearly state the steps that management should be involved in.

Scheduling

An agreement should be worked out early in the process with Line to decide scheduling or work priorities. Timelines are an important issue and can create unnecessary stress on the team. The team should be fully committed or equally committed some percentage of time. Other collateral duties work well if this agreement is reached early and the timeline adjusted. For example, the staff/line agreement may commit team members to Tuesday through Thursday on the watershed analysis with Monday and Friday for collateral duties. Most of the problems associated with collateral duties are a lack of commitment and clarity. A six-person team with three members committed more fully than the others, leaves part of the team reliant on absent data. A team set-up that includes a core team and support members will work only if the support is updated on progress, included in key meetings, and clearly understands team expectations of their input.

The level of public involvement needs to be clearly defined and incorporated into the scheduling.

The Federal Guide

The Federal Agency Guide for Watershed Analysis, Version 1.2, was used as a guide and not a cookbook by many of the first-round watershed analysis teams. This was a new process for many of the resource specialists involved in 1994. The modules provided guidance for methodology of analysis of various resource parameters. Because the modules are very specific, other resource processes cannot be easily integrated into them. Taken alone, the modules could inhibit synthesis. However, the steps in the process facilitate synthesis of module information. The causal mechanisms and pathways that are a part of the TFW process were also utilized by some teams. Incorporation of a synthesis framework in the on-going revision of the guide is recommended. In addition, development of missing or limited modules, especially in the social arena, is needed.

Data Compatibility

Incompatibility in technology and computer software between different Ranger Districts and the Supervisor's Office creates problems when sharing information or when the watershed involves two or more Districts. The problem is compounded by interagency incompatibility with software. Efforts toward a common language of science and compatible data bases are needed.

Consultants

With a shortage of resource specialists to do watershed analysis, there is an opportunity to contract consultants to fill the void. The team gains by hearing different viewpoints as well as seeing different methods of data

collection. Some difficulties may be encountered by different interpretations of the ROD as the consultant works with different agencies, their cultures and perceptions. While cost for consultants appears restrictive, charging $50.00 to $100.00 an hour, they are fully committed to the project, with no collateral duties. Overall, they spend fewer hours, which usually ends up being more cost-effective.

Conflicting Objectives

The same land area within a watershed may have conflicting objectives. For example, a demand for recreational use near streams may conflict with wildlife or aquatic habitat conservation. Areas within the watershed may be inside or outside the natural range of variability. Matrix and Reserve designations for these areas may not fit what is needed for the watershed. Conflicting objectives viewed solely within a watershed may also conflict in a larger context for what is desirable.

Conflicts cannot be completely resolved to satisfy all resource objectives for the same area. A hierarchy of resource objectives at all scales (e.g., from basin down to watershed, and stream channel reach up to stream system) is needed to see the entire context of watershed and landscape. Using the watershed analysis process and interdisciplinary interaction, look at the total context through a holistic approach.

Instead of individual disciplines wheeling, dealing and trying to reach a compromise, the watershed analysis provides information to the decision maker on implications of a given action. The land manager can then use this information to make an informed decision. Management objectives are not a part of watershed analysis but are dealt with as the result of watershed analysis.

In some places, the ROD is specific about the hierarchy of values within land allocations. Only if the first point is satisfied can the second be considered.

As specialists try to understand other ecological processes, they need to understand the significance of each. Is it of great or small significance? Is it a long-lasting impact or a temporary nuisance? Some conflicts cannot be synthesized or resolved at a watershed level. For example, mining laws govern despite what a watershed analysis identifies, or an endangered species may prevent treatment for reducing fire risk. Illuminating and putting in context the conflicts may be one result of watershed analysis.

Information Hierarchy

As with a hierarchy in values, there is also a hierarchy by resource. One resource topic may rely on information from another resource before they can proceed with their analysis. Several resource categories rely on landform and vegetation information. Some resource categories are "independent," such as geology and climate. How does the social context fit in? If there is some information that is basic to most other areas, should there be a hierarchy agreed to early in the analysis process?

The interrelationship of the resources is fascinating and helps us to understand the linkages of the processes that occur in a watershed. Early in the planning process, teams should agree to a hierarchy of information needs that will drive the analysis. The team should list all of the elements and then decide which are dependent and independent.

Regions 1 and 4 have been using a process to describe this hierarchy and have found it repeatable and predictable on other landscapes with the same characteristics. The Bailey System, which requires gathering and mapping the top hierarchy data first at a larger scale, has helped subsequent watershed analysis efforts. Data gaps higher up are more serious than data gaps at a lower level. Team members need to clearly define their data needs. The data order should follow physical first, then biological. Whether this hierarchy is reflected in the organization of the document depends on the individual watershed analysis.

Team Models

Several teams were formed to conduct watershed analysis in 1994. They were set up and directed in a variety of ways.

Stewardship Team Model

The watershed stewardship model assigns a team to a geographic area. Their long-term responsibility includes taking the lead in that area by performing a watershed analysis, and then eventual proposal review, project design and NEPA work. The benefit of this method is having one team become very knowledgeable on how an area functions and taking that knowledge through to project design and implementation. The challenge is maintaining a single team over the long term.

Detailed Watershed Analysis Team Model

With a shortage of resource specialists, watershed analysis teams are detailed in from other areas. A problem with this method is that the team members are not familiar with the area and have to start cold. Another problem is that the

team disbands when the analysis is completed, so there is no continuity to transfer knowledge and experience to the next phase of project design and implementation. The advantage of this method is that scarce resource skills can be shared with district personnel. By having the district people help collect information, they can become more knowledgeable about the area.

Co-Led Watershed Analysis Team Model

The co-led model is a self-directed watershed analysis team with no designated team leader. The structure consists of a unilateral resource team and steering committee comprised of Line officers and Forest staff. A Line officer assumes the role of "coach" and interacts with the team as needed for advice and encouragement. The team moves slowly in the start-up phase as roles get sorted out. Eventually, it moves more quickly. This type of structure fosters close team work and commitment. The structure can also be modified by have a rotating team leader. During the documentation phase, one team member is selected to be the editor. Two problems with this model are: (1) there can be a significant setback if a team member is lost, (2) with lack of supervision, there are no checks and balances or peer reviews.

Workgroup W-1
Linkages with Agency Decision Making

Moderators: Neal Forrester and Cindy Ricks

What is the Relationship between Watershed Analysis and NEPA? How will NEPA Analysis be Facilitated by Watershed Analysis?

Watershed Analysis is not a decision-making process and thus will not result in a decision document (this was not previously understood by some non-FS/BLM participants). Watershed Analysis results in information that will support decisions. Other agencies may not desire or need to be involved in the analysis. How do we foster participation of the other agencies at the next step of using WA for decision-making?

The Federal Guide creates a misperception that Watershed Analysis involves some decision-making in the guise of establishing Desired Conditions. For example, setting Desired Conditions for Riparian Reserves could be based on what the WA Team learned about the current conditions and trends (seral stages), how it got that way (disturbance processes), and the capabilities and potentials. However, the Team may only clarify or interpret the Desired Conditions for the watershed, given by the Land Management Plan/Resource Management Plan (LMP/RMP) and the President's Plan, but not create new goals and objectives. Establishing Desired Conditions requires public participation. Desired Conditions are also scale-dependent.

The gap between existing and desired conditions may lead to a management opportunity. Management opportunities provide the context for NEPA proposed action(s), and more than one action may be necessary to address an opportunity. The size of the watershed being analyzed will affect how specific the opportunities can be. The WA team also needs to identify risks associated with not taking an opportunity. One Pilot WA team provided opportunities that were specific to geographic management areas or by resource. Project NEPA analyses will clearly be facilitated by WA, but this doesn't mean that projects are described in the detail necessary for a proposed action. We will refer to WA or Basin Analysis, not "tier" to them.

There is a distinction between decisions about process and NEPA decisions. Fears that opportunities or recommendations might constitute legally appealable decisions may be unfounded, because Federal decisions to conduct activities must be made with full NEPA compliance.

The watershed analysis will help define and identify the purpose and need for a specific project proposal. Watershed analysis will also provide some of the initial scoping for project activities.

Watershed analysis will help determine logical groups of projects and activities within a watershed. It will also provide information to determine if the projects are similar, related or connected actions.

There are some opinions that with a few minor tweaks in documentation format, a watershed analysis could be a NEPA document for a group of projects within a watershed. Some concerns with this are:

- Scale: although some WAs are at a small enough scale to allow adequate discussion of effects, most are too large. Watershed-level analyses are not intended to be substitutes for project- or site-level analyses.
- The "all the eggs in one basket" syndrome: linking many projects to one decision puts all of the projects at risk of delay due to appeals and legal challenges. If the slate of projects are not closely interrelated, a better tactical approach may be to deal with projects individually; many may be categorically excluded. Decisions can at least be handled separately.

The watershed analysis may recommend needed actions in a watershed. Others are more comfortable with the idea

that watershed analysis will identify opportunities rather than recommend projects. (Some management units interpret a recommended action as a "decision" and aren't comfortable with doing it outside a NEPA document).

Several people in the group expressed a concern that some of the WA presentations over the first two days did not clearly identify that identifying either recommended actions or management opportunities was a major objective of WA. The need for WAs to clearly identify future management opportunities in some form should be highlighted as a result of this workshop.

The watershed analysis will provide a reference source for the existing condition and environmental effects sections of project NEPA documents. This is particularly true for cumulative effects discussions that are often difficult to do well for individual projects.

Watershed analysis will also help describe the effects of not doing a project (i.e., what are the effects of the no action alternative?). Historically the FS has not done a good job in project NEPA documents of describing the consequences of no action; WA should provide a good basis for this.

We need to present options (better than "alternatives," implying a choice of direction under NEPA) for future designs or scenarios. Broad futures may be nested within different scales, without focusing on details. Activities that are more or less appropriate in different places in a watershed may be identified. For example, salmon recovery planning will rely heavily on the aggregated results of watershed analysis. If WA only identifies management opportunities, and does not explore future scenarios, there is no information base for endangered species consultation. Proposed suites of projects should be compared with future designs. However, if future designs are articulated and used to narrow decision space, then we may have a "mini-plan" that essentially becomes decisional.

The President's Plan assumes that WA provides feedback using the Adaptive Management Strategy. The bottom line is that we need to stay legal under NEPA, NFMA, and FLPMA. WA Teams may recommend changes to land allocations or Desired Conditions in the President's Plan, but the current mechanism is to amend the LMP/RMP. We haven't yet fully implemented the President's Plan, so it is too early to initiate another round of planning. Some fears were raised that we have lost track of the intent of WA, simply to tell the story of the watershed and identify its liabilities and opportunities. The WA document should be a reference for NEPA Interdisciplinary Teams to make the recommendations. There is a danger that if WA becomes too involved with NEPA, it will lose budget and support. WA should identify inconsistencies and describe any opportunities for a change in land allocations.

How is Watershed Analysis Being Incorporated into the Existing Planning Processes? Is Watershed Analysis or Basin/Province Analysis a Substitute for Agency Management Plans?

Could the FS/BLM do a watershed plan as a result of watershed analysis, or does this violate NFMA? Watershed analysis/basin analysis/province analysis is clearly not a substitute for planning, such as that specified under NFMA and FLPMA. Traditionally we had two levels of planning that included the LMP/RMP and projects. The Integrated Resource Analysis (IRA) described in "Steps of the Journey" was the intermediate or watershed level of analysis, but not a decision process. NEPA documentation could cover a suite of project activities proposed by the WA. We can make individual decisions, even with a combined NEPA document.

WA will provide the background information for amending the LMP/RMPs. We need a strategy and process to capture information so we can explore decision making at basin, province and regional scales. Taxpayers will insist that the results of WA be aggregated and used.

Legislation was envisioned to convert from Forest-level to Province-level analysis and planning. The ROD includes a list of things Province teams should do, such as prioritizing basins for watershed analysis. WA Teams are trying to pick up the missing step and assemble basin-level information where they can. There are individuals at the watershed level with the leadership to make the linkages to higher scales. However, because WA is required to do restoration/jobs-in-the-woods, WA teams don't have the time to aggregate to the province scale. Data gaps and incompatible formats present a problem for Basin-scale analysis. The FS Regional Office has proposed a Pilot program for Basin Analysis. Information Centers would aggregate the data. Common data elements identified at the regional level may need to be supplemented at the province level.

Watershed analysis is a link between the agency management plans and project plans. As such, they need to be done in a way that allows the information in them to be aggregated upward so they can be used to revise and amend management plans. There is a concern that unless this upward linking/aggregating is recognized soon, a lot of the results and information being generated by the WAs may be very difficult to use in higher-level plans.

In addition to WA needing to be "modified" so it can link into the higher-level planning process, the higher-level planning processes may also need to be modified to accommodate watershed analysis as a key part of the overall planning process. This may require changes in the laws and regulations such as NFMA and FLPMA.

In the interim, WA can identify areas where the existing agency land management plans need to be amended or amendments that should be considered based on the results of the watershed analysis.

Land management agencies actually have some mid-level analysis (even though mid-level planning is discouraged), such as for Wild and Scenic Rivers, Roadless Areas, Congressionally-Designated areas, and analyses for Regional Guides. WA may allow us to establish a limited framework of potential cumulative effects. WA was developed without planners in the room. We need to integrate the planning perspective, and show where the decision points occur. The Federal Guide needs to clarify Watershed-Scale linkages with other scale activities, provide guidance on how WA results will be used in recovery planning, and identify minimum data to aggregate or compile at higher scales.

A concern about river basin planning - which comes first, river basin planning or watershed analysis? There are some river basin assessments being done now, but most are just a cursory look at issues. It was noted that all planning is iterative and circular in process, so watershed analysis and basin analysis may occur concurrently at first and, over time, issues at the basin level may help refine watershed analyses while the watershed analyses may help define the issues.

How does the Desired Future Condition in the Higher-Order Plans Relate to the Desired Future Condition in a Watershed Analysis? Which One Drives the Other?

We need to refine the terminology; watershed analysis should develop a future condition, not necessarily a "desired" future condition.

Desired Future Condition is a decision of higher-level plans, watershed analysis is not a decision process. In some cases, WA may lead to different "desired" future condition than the higher-level plan. This would have to be dealt with as a recommendation to amend or revise the plan.

Historical or natural range of conditions is a common means of dealing with desired condition in WAs. This leads to developing a *range* of desired conditions in a WA, not just one.

Desired Future Condition is often interpreted and used as the "bulls-eye" on the target; maybe the DFC is the whole target and the future condition of any particular watershed. The DFCs for some land allocations in the President's Plan are specific and may be "bulls-eyes," however, such as the Late Successional Reserves. In the matrix there may be a broader range of future conditions that meet the Desired Future Condition.

At some point, future conditions identified in a watershed analysis may be so different from the higher-level plan that it becomes a planning process rather than an analysis process. The third option of riparian reserve delineation in the South Fork McKenzie WA presentation seemed to be getting into a different DFC than the President's Plan.

How Should the Decision Maker/Line Officer be Involved in Watershed Analysis? How do We Ensure that the Project Decisions are Supported By and Use the Rationale/Analysis in the Watershed Analysis?

There is a concern that technical specialists are being "turned loose" on watershed analysis with little or no management direction from the line officer(s) who will need to use the results. It is critical that line officers be involved in setting the direction for the watershed analysis.

Issues and Key Questions are logical steps for the decision maker to be involved in to ensure that the scope and focus of the WA will meet management needs.

One way that works well is for the WA team leader to alert the decision maker at the points in the process when the team makes choices that will affect the scope of the analysis, its potential utility for implementing management activities and time frames. Short briefing papers work well to make the involvement efficient and provide a semi-formal way of getting line officer "sign-off" at key points in the process.

Another opinion voiced was that although the line officer can help set the scope by limiting issues, the WA team should have the option of proceeding with some things if they agree it is critical to the analysis.

Watershed analysis is supposed to tell the "story" of the watershed and this story is ultimately what has to be used as the basis and rationale for proceeding with projects and activities. In order for this to happen, the story has to be told concisely and focused on the issues and key processes, preferably in 5-10 pages. Supporting analysis and background information is important, but can be indexed and used as appendix material.

Decision makers need to be careful not to get lulled into a false sense of security just because an iteration of watershed analysis has been "completed" on a watershed. The scope of the analysis needs to link with the potential impacts of the projects being proposed.

There is a concern if the line officer limits the scope of the WA, the analysis may not be adequate to support the types of activities that may be desired later on; no linkage between the WA and the projects. The BLM is addressing this by having a "gate keeper" (usually the WA team leader) that continues to track project proposals and project decisions made in a watershed after the watershed analysis is "done." A similar concept is the "watershed steward."

The bottom line is that watershed analysis has to meet management needs. The managers/decision makers need to be involved in WA and provide clear direction for the WA team based on the choices the teams identify.

How Does Watershed Analysis Relate to Other Analysis and Planning Efforts Required by the President's Plan, AMA Plans, LSR Assessments?

We need to try and minimize additional work; LSR assessments should be done in conjunction with watershed analysis whenever possible.

Complicating factor is that LSRs generally do not follow hydrologic boundaries used to determine the area for WA.

The objectives and purpose of LSR assessments and watershed analyses are different. It may not make sense to try and combine them. The watershed analysis may provide some information and related analysis for the LSR assessment, but not interchangeable.

Concern that doing LSR assessments as one step, watershed analysis as another is leading us to deal with the land and resources as separate pieces, not making the linkages. The result being a big pile of paper leading nowhere.

AMA plans would likely be NEPA planning/decision processes. Watershed analysis may be one component or assessment that is used to develop an AMA plan. Economics, social, etc., are other factors that may also have individual assessments and then be blended with WA(s) to develop an AMA Plan.

Where is the appropriate scale for adaptive feedback and change? The direction from the FEMAT Adaptive Management Group is at the lofty, non-specific level. No thresholds for revision were established at the Regional scale, such as those identified in the LMP monitoring plans. Some say politicians still have totally unrealistic expectations for timber production. WA needs to show if volume targets are unreasonable, and get it on the table.

There is a conceptual or philosophical difference between views of whether management direction dictates desired conditions or if actual conditions and trends (described by WA) are used to help set management direction. Some kinds of management direction are non-negotiable, such as the Wilderness Act. Watershed analysis allows us to look at conditions at multiple scales and examine interrelationships. Research scientists established watershed analysis to help us understand plausible future scenarios and alternatives. Rather than focusing on understanding ecosystem linkages, we are engaged in a Planning exercise.

One of the most important products of a watershed analysis will be to identify future trends or scenarios. This analysis should focus attention on current options and potentially lost opportunities, in terms of social trends and natural disturbance, and in terms of resiliency of the watershed. The analysis would consist of a spatially explicit (i.e. mapped) description of a condition taken through time, to project future consequences.

To accomplish this analysis, the framework needs to be consistent across a province, using design principles that have yet to be established. For example, for fuels risk, we can provide a spatial representation at an appropriate scale (without the details of exactly where) of fuels risk, to evaluate stage, condition and density of trees. We need to analyze at least the baseline scenario from implementing the President's Plan. The Federal Guide should lead us to this step.

How much time and energy do we invest in analysis without making decisions? We need enough consistent information about the range of potentials, biological, physical, and social, to support decisions at each scale. A Land Manager perspective is that it is consistent with the President's Plan to project a plausible future, but that we need to consider budget reality (particularly following the election) and be sensitive to private landowner fears about Federal Analysis. Not looking and continually looking are equally dangerous. A Researcher perspective is that WA at different scales will actually streamline and create efficiencies for decision making. The ROD gives some decision space associated with riparian reserves. We need to understand the ecological consequences of maintaining default riparian reserves, as opposed to achieving other, more desirable states. We also need to test the President's Plan, and may have a very narrow window of time to accomplish this.

What futuring information in WA is critical for higher level planning? Some scenarios may be more appropriately analyzed at the basin or province level, using aggregated information from the watershed scale. What is the purpose and need for evaluating scenarios? Futuring may be necessary in some watersheds, or may require sampling at the watershed scale rather than analysis in every watershed. We have agreed that some level of futuring is important, but are still uncomfortable about where the associated planning process will occur. Without basin- or province-scale planning, LMP/RMP amendments are the only mechanism available.

US Fish and Wildlife Service (USFWS) expectations for Watershed Analysis: USFWS needs early involvement in WA. The Federal Guide and supplemental questions identify the needed information. Some Pilots have conducted an LSR assessment concurrently with WA, and included it in an appendix to the WA. This may be efficient when the LSR is contained within the Watershed so that the scale is appropriate, and when the issues to be addressed are similar. The ROD encourages this.

Linkage of Watershed Analysis and ESA Consultations

USFWS encourages watershed analysis as a good way of providing background and contextual information that is useful when asked for determinations on individual projects. LSRs are very important and we need to find out how they are functioning through WA or some other means. The FS needs to prove that the LSRs are successful in providing owl recovery through information such as reproduction surveys, etc.

In order to provide the information needed to make a determination of project effects on habitat, it may be necessary to do analysis of areas larger than watersheds, i.e., dispersal habitat and corridors between LSRs.

ESA Consultation:

WA will not replace consultation, but the information will expedite consultation on a programmatic or project basis. Watersheds may not be the appropriate scale to address the habitat conditions and processes required for some species. The USFWS biological opinion assumes that the ROD will be fully implemented. Substantial changes could require re-initiation of consultation and possibly affect the jeopardy call. If the President's Plan were not fully funded, affecting recovery or maintenance of species, reconsultation might be required. There are many assumptions in t;he ROD that need to be tested. A forum is needed to resolve data gaps and incompatibilities.

Does USFWS expect WA to include entire watersheds, and to identify opportunities on private lands? Responsibility is divided in the ESA office between Federal and private lands. Must consider how private activities might affect Federal Lands. Because of the TFW process in Washington State, the private landowners are more involved. Recovery plans for owls are being developed for private lands. ODFW and some other State agencies are considering using WA in granting permits. The effects of implementing the minimum requirements of the Forest Practices Act may be a worst case. If private landowners want credit for additional protection, they need to provide this information.

Workgroup W-2
Watershed Analysis and Land Allocations

Moderators: Mike Redmond and Diana Bus

In what ways is watershed analysis related to Riparian Reserve (RR) boundaries? How could Watershed Analysis affect the width of a Riparian Reserve?

The discussion centered around the importance of the reserves and the mechanics of making any adjustments in the interim boundaries. There was a good understanding in the group that changes to the interim boundaries could not be made without a Watershed Analysis (WA) and that any recommendations to make changes would have to be supported by the analysis. In one analysis, there were several recommendations to modify the boundaries based on the objectives of the Aquatic Conservation Strategy (both expanding and reducing) and in another example, no changes were recommended because it was felt that they did not have enough information to propose different boundaries, so they stayed with the interim designation.

Several individuals were quite frustrated that the feedback they had received to date indicated that there would be no way to adjust riparian reserves until all the science was known about all the species listed in C3 and Appendix J2 of the Northwest Forest Plan. The thought was, "why do WA at all?" if that was truly the case, since we'll never know everything about all the species.

The group concluded that teams working in watersheds with a significant chunk in Riparian Reserves were more likely to have tackled the size question than a team where the amount of RR was a small percent of the watershed.

There was a discussion around the appropriateness of determining Desired Future Condition in WA. Several thought it should be left to a NEPA decision while others thought it could legitimately be covered under watershed

analysis. Land allocations point you in a direction for DFC which can be refined with WA.

There is concern about how mining progresses in relationship to Watershed analysis. You can display the effects of what mining does to an area, particularly in a cumulative effects way. However, the likelihood of actually stopping an activity, given the 1872 mining laws, is highly unlikely. This causes concern and frustration as well as potential resource impacts to the watershed. It also displays that existing laws and WA must mesh together.

Key points, conclusions, or questions:

- WA is required to make changes in RR boundaries. If not us, then who? If not now, then when?
- Since WA is not a decision process, changes may need to go through the NEPA process.
- Should changes be made (through NEPA) project by project (piece meal), or for the whole watershed at the same time?
- Will the Augusta WA approach be acceptable, or is this going beyond what was envisioned in the ROD?
- Felt a need for clarity regarding whether or not you have to actually have science for all the C3 and J2 species.
- Ground truthing of map information is an important step, particularly for stream and road information.
- Different issues affect different locations, such as fire or geomorphology.
- What is truly good enough? Need more standards and line management involvement to set the sideboards and provide leadership. Although the group recognized that a "cook book" will never work.
- Lots of creativity out there. Take advantage of it.
- Many data gaps. How does that effect our credibility?
- Inconsistency around what timeframe to use for geologic features (unstable lands). Some locations used 100 years. However the FSEIS identified an unstable area as something that had moved in the last 400 years. Where did that number come from? Wide range of interpretations. Needs clarification.
- Are there minimums (either data, analysis or ??) needed to make riparian reserves smaller?

What is the relationship between WA and the Adaptive Management Area (AMA) Assessment? What is the linkage between WA and Late Successional Reserve (LSR) Assessments? What is the importance of WA in managing Wilderness Areas?

It was noted that all of these land allocations require their own assessments or plans (i.e., AMA management plans, LSR assessments and Wilderness management plans). The discussion centered on the timing of WA and these other assessments/plans, and how they may interrelate.

The group shared information about several LSR assessments that had been completed. The group felt a real need for REO to share information about the "good" LSR assessments so others could learn from them. LSR Boundaries are not always compatible with Watershed boundaries.

Key points, conclusions, or questions:

- In one WA that was completed, the WA team noted that all but two of components required for an LSR in the ROD were covered by their WA.
- Because of the similarities in the objectives of WA and the above assessments/plans, it may be advantageous to do them simultaneously.
- Where an AMA, LSR, or Wilderness Area encompasses several watersheds, is it better to do all of the WAs before doing the other plans or would it be better to do the plans first?
- It may be difficult to coordinate the different types of analysis where the boundaries of the watershed and the land allocation do not correlate well.
- Information learned through watershed analysis could help define the things to test or demonstrate in an AMA.
- AMAs could be a place to link information that is learned from one watershed to another.
- Several in the group thought AMA plans should come before watershed analysis to help focus the WA, particularly for those AMAs that make up more than one watershed or where AMA boundaries are not compatible with Watershed boundaries.

Does the amount of private land in a watershed affect the land uses appropriate for Federal lands? How

would such considerations be addressed in the watershed analysis?

The discussion centered around how we interact with the private sector when we are doing a WA for a watershed with a large proportion of private lands. There was a lot of concern for being able to get data from an untrusting private sector. There was a good understanding in the group that activities on private land can impact the uses that occur on Federal lands, because of the watershed scale of the Aquatic Conservation Strategy and the cumulative effects that can be assessed as a result of including all lands in an analysis, as well as recognition that activities on Federal land can impact private land.

Key points, conclusions, or questions:

- The experience of some in the group was that the private sector was skeptical of our need for data on private lands and were fearful the data would be used to regulate uses on their lands.

- Additionally, private landowners were concerned that by sharing their timber inventory data, they could violate anti-trust laws. Be careful how you ask for the information.

- Much information can be obtained from air photos, state information and so on.

- Some success was seen by others when trust was built up between the Agencies and the private sector. This was done by demonstrating how the data would be used and the opportunities for Federal funding of projects on private land (such as stream enhancement). One point here: works better if you call it enhancement rather than restoration.

- Agencies need to have their "own act together" in terms of what data we need and already have before we go to the private sector with requests for help.

- It was the experience of some that WA analysis in watersheds with a lot of private lands resulted in the need to refrain from management activities (especially timber harvest or road building) on Federal land because of the lack of connectivity, aquatic habitat, and terrestrial habitat on private lands.

- Keep in mind that private landowners have a bottom line (dollars) that's critical to them. Do all you can to help them avoid costly jobs.

- Although permittees are not private landowners, they do have significant interest in what happens around watershed analysis. May need guidance for how to incorporate their interests, as well as get their cooperation.

Should President's Plan land allocations be used to set priorities for watershed analysis? Which areas should be evaluated first? Why?

To some, it appeared there existed consistent direction between the different agencies on the priorities for scheduling watershed analysis. The discussion centered on which watersheds were chosen first by the participants and why.

However to others the answer varied widely. Some thought Key watersheds are initially the most important, but after that it should be a district (or resource area) prioritization process based on where the problems are. At least one individual did not even agree that all key watersheds should be done first, particularly those that are significantly composed of wilderness where few management activities can or will happen.

Key points, conclusions, or questions:

- Key Watersheds, AMAs, restoration needs, interagency cooperation, and other management needs (projects) were the main criteria for choosing and scheduling watersheds.

- Land allocations per se were not seen as good criteria for scheduling watersheds.

- What role will the new Provincial Advisory Committees plan in prioritizing the scheduling of WA?

What is the relationship between WA and Wild and Scenic Rivers (W&SR)?

It was noted that the ROD does address WA and W&SRs in the Standards and that W&SRs are one of the areas that are included in the Congressionally Withdrawn land allocation.

Key points, conclusions, or questions:

- W&SR plans need to address the Aquatic Conservation Strategy Objectives.

- WA does not change Congressional direction for designated areas, but may influence how the areas are managed consistent with that direction.

There was a discussion on the appropriateness of desired future conditions being developed in WA. The group was

split, with some in the "no, that's NEPA" camp and the rest in the "yes, that's okay for WA."

Workgroup W-3
Watershed Analysis and Projects

Moderators: Joni Sasich and Debbie Whitman

Introduction

One of the purposes of watershed analysis is to look at larger spatial and temporal scales which will better define the context of issues and help guide selection and implementation of projects. Experience with application of watershed analysis in guiding projects was limited among the discussion group participants. Only about 5 percent had experience with the full process of watershed analysis, NEPA and project implementation. Most had experience with implementing transition strategies, where projects were screened as being "appropriate" and a short-timeline watershed analysis was conducted to support the identified projects.

Within the discussion groups, Bureau of Land Management, U.S. Forest Service, Oregon Fish and Wildlife Service, U.S. Fish and Wildlife Service, U.S. Forest Service Research, and several non-agency participants representing special interests were represented. Most participants had conducted or were in the process of conducting watershed analysis as team members, several were team leaders, less than 1% were line officers, and several participants indicated that they had program direction responsibilities.

Discussion questions were selected and prioritized by two separate discussion groups. As group discussions tend to do, discussions on some questions overlapped. A natural grouping of topic areas resulted. This paper is organized by these groupings.

How is watershed analysis being used to support project decisions? How are opportunities identified?

There has been a tendency during the first round of analysis to focus on watersheds where projects have been identified and planning has begun. This was especially true for the interim watershed analyses for the 1994 restoration program and continues with the transitional analyses. In the short term, this seems unavoidable. The President's Plan made several promises: restoration, protection, products and public participation. If not accomplished within reasonable timeframes, watershed analysis could be seen as a roadblock to achieving these promises. The possibility exists to lose support because of our inability to produce.

Many projects are brought to us by outside groups/individuals. These needs must be included in our prioritization of analyses. Also, opportunities for partnerships and possibly funding may be lost if we are unable to focus a watershed analysis on some of these proposals.

Several in the group were concerned that the pattern of projects driving watershed analysis would continue. Without basin and/or regional plans, it appears we are approaching the process backwards. Our public credibility could erode by management continuing to have potential projects driving the analysis. We should be honest about our reasons for doing a watershed analysis at a particular scale because we have an interest in a particular project. We should also be very up front as to the limitations of the analysis with respect to adequacy of support for other future projects, particularly in the interim when some will be focused on certain types of projects.

As we move into the future, the focus should shift. Ideally, the analysis will drive the identification of management opportunities. We all have pre-WA ideas as to the problems and opportunities that may exist in a watershed. Some may be brought forward following the analysis, some may not. Experience has shown that the interdisciplinary process that occurs during the analysis can produce a wider array of projects that can meet multiple needs. Some projects have been stopped or dropped, even though much effort had been expended on them. Some projects ended up with a much broader scope than originally expected. We must allow adequate time for interdisciplinary team development. The process of learning from each other, understanding different perspectives and disciplines, will result in more appropriate projects that are truly interdisciplinary.

Project identification should be based on good science. This is difficult if not impossible with limited information. The level of project specificity should depend on the information available. A small group felt that enough information should be gathered during the analysis that would enable the identification of specific project proposals.

Some felt that the analysis should document what is working and what is not, then give recommendations on the types of projects, and in some cases specific projects, to fix the problem areas. Several methods were discussed. One option is to identify the processes/functions outside the historic condition, then propose types of treatments to bring the watershed back to within that range. Another proposal is to show management opportunities by comparing existing condition to desired conditions.

Others were more comfortable with identifying opportunities in the landscape and prioritizing areas for treatment. Specific project identification would take place at the site-analysis scale.

Another concept was the identification of project "unopportunities." The analysis should identify areas where we should not operate, or could operate only in certain ways. Identification of these areas would highlight the sensitivities that should be addressed if any activities are proposed within them.

There was general agreement that, at a minimum, the WA should identify the data gaps. What information do we need before appropriate projects can be identified and implemented?

What is the appropriate level of watershed analysis to support desired activities? Should the level of analysis be different for different activities? How is the appropriate level decided?

There were divergent views on how one should approach determining the appropriate level of watershed analysis. Many participants voiced the need to match the level of watershed analysis with the expected level of risks or complexity associated with activities to be conducted in the watershed. The opposing view was that there is a risk of not conducting a true ecosystem-based analysis by narrowing the scope of the analysis using projects or risk as the determining factor on level. An individual from a regulatory agency asked, "...are we meeting the intent of the ROD? Is it not the ROD that brought us to doing watershed analysis in the first place, i.e., for species viability...?" The transition period for watershed analysis and ROD implementation provides the opportunity to examine adequacies of different levels of analysis.

There seems to be a need for additional policy direction or an accessible process to assist with deciding on conducting a watershed analysis and to what level. Several participants shared a concern over the need to conduct watershed analysis prior to implementing minor activities, such as installing picnic tables, or federal projects, such as federal highways outside the purview of the land management agency's decision authority.

The appropriateness test is rapidly upon us as we begin to implement projects from watershed analysis. Rebuilding trust with the public and providing decision makers with an adequate level of support for management activities were two important themes to the group. For example, if a project is implemented with a rationale that cannot be tracked through or is completely absent in the watershed analysis, then the analysis may not have been conducted at the appropriate level. If lawsuits continue based on inadequate watershed analysis, trust has not been rebuilt.

Should the level of analysis be determined by risk, i.e., risk to the resource or risk, politically? Some felt the answer to this was yes. The alternative opinion was that this is an "old" way of decision making that had not worked well for the Forest Service in the past, and that we should try a new approach with watershed analysis.

Several experiences were shared where a wider scope analysis had brought to light the need for a different intensity or location for restoration than what had been thought initially. Initially it was thought that reducing road density would solve all "ills." Upon completion of watershed analysis, many other additional restoration activities became apparent to management. Others mentioned the need for data gathering to adequately support some projects with analysis. Where is this existing data, anyway, particularly when it comes to wildlife?

One recommendation was quietly offered, and most of the group agreed..."As a part of every analysis document, and particularly on those that we choose to do a scaled-back version, a statement "up front" in the document should reflect the level of projects that the analysis is intended for and what activities would require another iteration of analysis."

Staff time and cost required to do the analysis is a reality that is needed to be sorted out with the level of watershed analysis. Some feel that line officers expect a complete analysis that supports all activities in a watershed to be conducted in a matter of weeks. There appears to be a lack of understanding of the level of data needed to meet the expectation of the President's Forest Plan. Watershed analysis teams should be involved in setting timelines to ensure that unrealistic expectations are avoided.

Unanswered is: How do we decide what level of watershed analysis is appropriate, particularly with the mixture of expectations that surround us?

When does watershed analysis become a decision document, and what is the process to get from watershed analysis to NEPA?

There was some discussion on the question of... Could the recommendations in the watershed analysis preclude options for the decision maker, and, as a result, become decisional? The group was not sure there is an answer for this question. It will depend on the circumstances and how the information is presented in the analysis. Generally, when a decision maker signs something that is acknowledged as a decision, NEPA gets involved.

Watershed analysis is a supporting document. It never becomes a decision document. If it does, it is no longer watershed analysis.

There is a direct link between watershed analysis and NEPA, but they are definitely separate processes. The analysis can and should support NEPA decisions. The processes/functions described should form the basis for determining the objectives for a particular area. A proposal must track from WA to site analysis to NEPA. If it looks like it came out of the blue, you have not done enough analysis.

There was concern expressed over separate analysis and implementation teams. The link will be lost without good communication between these groups. Methods to transfer watershed analysis to personnel responsible for project implementation need to be developed to guarantee full understanding and use of the analysis.

WA should make the NEPA process much easier. Involvement by regulatory agencies should pay off during the consultation process. In addition, the analysis provides a means of integrating social aspects into project selection. The interchange of social and bio/ecological interrelationships before a decision is made, rather than after, should result in better decisions. Also, watershed analysis can be a tremendous educational tool. By sharing this information with our public, legal challenges may be avoided by obtaining informed consent.

How will project proposals be different? (particularly in relation to private land issues and the planning and management of catastrophic events)

Watershed analysis should identify types of restoration projects with the highest potential benefit. Analyses that have been completed so far have shown that frequently these restoration opportunities are located on private land. Regulations prohibit spending Forest Service and BLM restoration funds on non-Federal land. All felt that the analysis should consider private land, including the identification of problems and opportunities, even if we can't expend Federal funds on restoration or enhancement. Land acquisition opportunities/needs can also be identified during the watershed analysis.

In many cases, the cooperation of the private landowners is difficult to obtain. Perhaps their past experiences with Federal agencies has been less than satisfactory. The worst approach to take is to tell them what they need to do. The best approach is to provide information and alternatives, including potential funding sources. One tactic that has been successful is to approach the private landowners through agencies with which they have an established relationship. State agencies can be extremely helpful.

Many landowners have a long-term view and would like to cooperate, but participation is difficult without funding. Funds are available for restoration on private lands - grants, State funding, USFWS restoration funds.

The group expressed concern about the potential devastating effects of catastrophic events. Private landowners, our neighbors, have also expressed concern about possible higher risk to their property. Some in the group felt the President's Plan (with the reserve concept) has set us up for a higher occurrence of catastrophic events, including fire, windthrow, and insect and disease epidemics.

The conclusion of the group was that the analysis should address processes and functions, not just current conditions. We need to acknowledge that fire is a natural condition that will occur and can't be avoided. We need to look at resiliency of the landscape. How effectively can the watershed withstand catastrophic damage from a variety of agents?

The analysis should assess risk levels and identify opportunities to reduce the risk. One option is the reintroduction of fire. Conflicts with smoke management and air quality have occurred with these proposals in the past. The watershed analysis may help with how regulatory agencies look at the issue, i.e., the impacts to air quality through prescribed fire v. wildfire.

How can watershed analysis identify appropriate projects within riparian reserves?

Watershed analysis can provide an understanding of the historic processes that have influenced structure and function of the riparian network. Identification of projects would be based on this understanding. Some examples that were discussed were:

- A dense stand of 40-year-old trees that historically supported a less dense stand could be thinned.

- Old growth conditions in riparian areas on the eastside may not be typical of historic conditions. Continuous old growth lodgepole, for example, may set the stage for a large scale disturbance from fire or insects that drastically alters function and structure. Management using an understanding of disturbance regimes could minimize this large change in riparian habitat.

- Extraction of wood through selection harvest could be conducted in some riparian reserves and still retain

function and structure. This would be consistent with meeting aquatic conservation strategy objectives.

- Should we convert white fir late successional reserve back to pine because that was what was there naturally? Natural disturbance regimes would have kept riparian stands in a more diverse vegetative condition than they are presently.

Some were concerned that "function" is in the "eye of the beholder." What difference is there between a 20-inch dense piece of wood in the stream and a larger, 32-inch piece with large growth rings? Silvicultural treatments can create different structure, but is quality of that structure important as well? Function of a young riparian stand is different than an older stand, so should we have different objectives for successional stages?

The South Fork McKenzie watershed analysis proposed three alternatives to riparian reserves which would direct different approaches to projects. Their alternatives recognized that a portion of the reserve strategy is to provide for upland connectivity. For adequate inclusion of connectivity objectives, non-riparian components of the landscape, such as ridges, may be needed in the reserve network. Some riparian areas would be traded for these terrestrial components where the analysis supported doing so. With this approach, objectives for reserves may be more clearly defined and more readily identified on the landscape.

There is a reluctance to reduce reserve widths, particularly along intermittent channels, because of the lack of knowledge surrounding the "survey and manage" species dependent on these habitats.

Management by riparian width reserve does not obviously display different functions within the reserve, e.g., floodplain, inner gorge, channel. Connectivity of functions to adjacent uplands can influence the riparian reserve. Projects may be defined by our knowledge of the various functions of these components.

<u>Conclusions and other discussion points not to lose track of....</u>

Participants did not have a wide familiarity with implementing projects under watershed analysis because this process is new. First-hand experiences with implementing projects were limited. Although project-driven analyses have been common, future analyses will drive the identification of management opportunities. Project identification is difficult with limited information, and the group generally agreed that the level of project specificity should depend on the information available. As a minimum, the analysis should identify the information gaps. Opinions varied widely on level of analysis to support projects. Still unanswered is: What level of analysis is appropriate, particularly with conflicting expectations? Watershed analysis and NEPA are linked; NEPA involves a decision, watershed analysis does not. The analysis should include the problems and opportunities on private land. The analysis should assess risk level of catastrophic events and identify opportunities to reduce the risk. And, finally, projects in riparian reserves should be based on an understanding of the processes that have influenced the structure and function of the riparian network.

<u>Miscellaneous:</u> The thoughts listed below were shared during the discussion. They do not fit in the above categories, but are included here as they seem relevant to discussions surrounding watershed analysis:

- Funding for watershed analysis is increasing while funding for implementing projects is decreasing. Will we have funds to implement projects after analysis is completed?

- Much of watershed analysis work requires journey-level professional skills. The expectation that watershed analysis is a source of work for "Jobs-in-the-Woods" is unrealistic without college-level training.

- Seems to be "concept creep" in the use of the word "restoration." Restoration seems to be used for enhancement, extractions, and vegetation management as well.

- Many non-pilot watershed analyses have been completed. IWACT should have the benefit of these experiences as well as the pilot watersheds.

- What about provincial-level and basin-level analysis? Are we missing the tie to the larger landscape that is essential to the credibility and/or level of watershed analysis that can be conducted?

Workshop W-4
Watershed Analysis and Monitoring

Moderators: Deb Carter and Dan McKenzie

Question... So we monitor? So what? Assume that you are monitoring a parameter and you see a small change... how does that change any management? The answers would be different depending on whether you are talking about implementation, effectiveness, or validation.

Monitoring needs to be tied to adaptive management. Leads to changes in management direction. Why are we monitoring? If you want to learn by doing, you have to monitor. Needed as part of the feedback loop. Question becomes one of "how do we make sure that monitoring results are distributed to the proper people," how to do it and who are the "proper" people?

This implies a lack of follow-through that uses monitoring to effect a change in management. We are paying for a relatively poor track record of completing the adaptive management loop.

How Can You Monitor an Ecosystem?

This is too broad a question to be workable. We need to identify the specific questions of relevance and design the monitoring around that. Questions need to be holistic, interdisciplinary.

There was a proposal that doing iterative WA represents a monitoring program. The integration of the WA is what makes the difference (i.e., iterations provide a basis for comparison and identification of trends). The initial questions of WA are specific. WA produces as many questions as it answers. This points to research needs. An example is the owl recovery plan and the assumption that we need to monitor all species, when in reality all you can do is monitor those species about which you know something.

Monitoring is a sample. WA focuses questions and points to specifics which can be effectively monitored (i.e., width/depth ratio, LWD, percent pool area). This is a counter argument to declaring the WA as a monitoring plan. Need to be as specific. Cost is a major factor in needing to focus on a specific and finely-defined question.

There was agreement that ecosystem monitoring was not possible, but that specific characteristics or processes of the ecosystem can be chosen to represent the physical, biological, and social aspects of the ecosystem. These need to be focused, goal-oriented studies that are best conducted by research at a small project-scale for the purpose of monitoring or identifying interactions between physical and biological processes.

Using the human health analogy, temperature can be monitored effectively as a representation of the well-being of an individual. But in ecosystems, when extreme events such as Mt. St. Helens occur, is that unhealthy? The answer is related to the relative rate or frequency of events such as volcanism or other catastrophic events. How can we monitor to evaluate the systems with an index approach when there are the rare catastrophic events that may reset the ecosystem? Such rare events may have time scales that exceed the political or budgetary time scale.

Need to account for natural variation of the systems. Need to focus on the sensitive sites. WA is supposed to tell you what and where these are. Ecosystems are never destroyed, they just change. "Dynamic equilibrium" is a concept that can be used as a basis for concern or detection of significance.

The suite of parameters, including physical and biological, should also include human, economic, social, etc.

There is a concern about "anthro-ing" the systems too much. Ecosystems are so complex that the human health model is probably not the right concept to answer the multiple issues that are relevant to ecosystems.

There is a need for iterative WAs to answer the dominant monitoring questions. However, the requirement to conduct multiple WAs immediately will prohibit iterative WAs in the near term.

What is the driving force behind monitoring? Tribal? ESA? Brush fire management?

We also need to monitor the assumptions that we made in our WA. We need this to refine our process and ability to predict well.

There is no general consensus that iterative WAs would provide fundamental monitoring programs. This may be OK as long as the same people do the work. There is disagreement that WA provides a basis for replication, regardless of who accomplishes the work. WA does seem to provide at least a good "baseline" monitoring, but WA is probably not too good for effectiveness monitoring.

If the WA process changes over time, we will lose the replication ability as effective, consistent monitoring.

Representation that monitoring is "best science available" and that WA is "best judgement." This is an attack on the notion that WA is adequate monitoring. A photo point is "good science" that allows replication and successive expression of "best judgement" about what the conditions represent or the degree of change that has occurred.

How should we decide what to monitor?

If a WA is to identify data gaps, monitoring should be used to fill in those data gaps. WA may ask the questions, but may not answer them. This focuses emphasis on long-term monitoring needs. Simply rewriting the WA will not fill the data gaps that were recognized. WA identifies the

data gaps, inventory fills the gaps, monitoring is used to continue with data gathering of these variables.

Monitoring v. research: There is considerable confusion about the difference in rigor between research and general monitoring in the USFS.

There is a general recognition that the federal agencies have not done a good job of asking the specific questions to drive the monitoring... we don't set clear objectives. Inventory is establishing a baseline to ask "what is out there?" Monitoring is looking to answer a question. Inventory is generally a one-time event to provide information about the character or composition of a certain variable or process. Monitoring is the repetitive investigation to determine change. It is important to reach a consensus on the definition of these terms.

WA poses the questions needed to validate how we are implementing the S&Gs and the Forest Plan. Monitoring should be used to evaluate desired condition achievement.

WA could help us understand the range of variables and this would be useful in establishing monitoring needs. Example... very low turbidity standards when the natural range is very large. The ROD (B10) provides a one-paragraph explanation of how WA leads, through iteration, to understanding the range of conditions.

There are substantial differences of opinion between DFC *versus* range of variability.

WA stratifies the landscape and isolates areas of concern and helps to focus monitoring on the areas of greatest need.

WA provides a basis for setting the framework for monitoring. It tells us what is important and where. And, it tells us the important questions and needs.

There is some thought that effectiveness and project monitoring may not be that important. It takes a long time to see results. Ecosystem monitoring provides bigger benefits. Question revolves around the lack of specificity in the monitoring objectives (i.e., did the timber sale affect the fish?). That is a very big question. Need to be clear about monitoring objectives and methods.

What types of information are needed to design a monitoring plan? What do we have already in place?

The first thing you need is a good statement of objectives. It must be measurable. Refer to EPA's document on monitoring... it lays it all out.

- Objectives
- Methods
- Sampling design
- Sense of confidence
- Strategy... sampling temporally, spatially
- Analytical methods
- Information must be sensitive...right parameters
- Information must be readily available
- Affordable information

We are so early in the process with the "survey and manage" species that folks are just now developing protocol to determine if we can do this at all. The biggest concern is around the "sensitivity" component listed above. For many of the "survey and manage" species, we don't even know what the critter looks like and where it is, let alone how the species will respond to management. This is a problem, because the selection of monitoring variables is predicated on selection of variables that will show change. WA is not going to take care of the lack of knowledge about the "survey and manage" species.

Should the monitoring be statistically rigorous? A lot of times our monitoring is discredited because we try to take it beyond the population we are sampling.

Example of sampling three times in one reach, three times in one stream, or one time each in three streams. Each offers ability to make different conclusions and provide a different ability to extrapolate.

Some things are not subject to quantitative monitoring, but we still need to talk about and determine confidence in our monitoring.

Design must include affordability. There was no consensus about the correctness of this assumption and the use of surrogates for high cost, high variability parameters.

To what extent can habitat monitoring stand in for population monitoring?

Simple...it can't. We don't know the relationship between habitat arrangement and amount and population levels.

Court cases and decisions back up the need for decision to be based on the populations.

If you can't use habitat to evaluate populations, then the previous discussions about the use of surrogates or specific variables becomes moot.

You cannot assume any strong relationship between habitat amount/quality and population size. Are there any species

that are suitable for monitoring habitat to indicate populations? No one came up with any.

What question about the populations are you trying to answer based on habitat? If it is rate or magnitude of change, the challenge comes from uncertainty about complicating factors... e.g., seals, ocean currents, etc.

The ROD makes the assumption that habitat and species populations are linked and related (i.e., the limitations are habitat factors, not biologic factors). Considering habitat as an expression of the potential for populations to occur may be reasonable.

Some pretty strong views that conjecture about populations not being there based on habitat availability are more supportable than conjecture that the populations would be there.

Habitat can possibly be useful for looking at trends and thresholds. This viewpoint was disputed.

There needs to be a cross-check between monitoring habitat and populations to get confident inferences. Cross checking gets to monitoring the interactions, and this is more directly related to monitoring the ecosystem.

Are index species a useful concept in monitoring?

There was consensus that the answer is "yes" if the question was "Can index species be useful in monitoring?", rather than "are" they. Also need to define "index."

The concept includes things like lichens which tend to concentrate air pollutants. This points to the benefits of looking for species which will serve to answer questions at broader scales. Really need to look at the question and choose the best tools to answer the question. There was concern about generalizing complex questions to think that all the answers will come from one species.

Indicator species have been seized upon because they are easy. We really need to look for ways to pick indicators of species and processes.

What did not work?

Peer review of monitoring programs has been a problem and has resulted in monitoring program failure. Need this feedback prior to implementation.

Many times we get into monitoring programs and then just continue them. We need to evaluate these programs annually. Look at page 20 in the EPA manual.

Need to state very specific questions to guide the monitoring. This goes back to the clarification of the management objectives contained in Forest Plan.

Need to track implementation of management opportunities developed in WA.

Scale.... this is dependent on the variables selected for monitoring. Need to look for opportunities to leverage monitoring across larger areas. Keep from reinventing the wheel.

What did work?

Some discussion of temperature monitoring on the Nestucca that allowed the team to describe what the fish were living in, extrapolate about effects and disease thresholds.

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